# HP Color LaserJet 4700 and 4730 MFP Series Products - PQ Defects Guide


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## Overview

Welcome to the HP Color LaserJet 4700 and 4730 MFP Series Printers PQ Defects Guide. This guide will be updated as needed to reflect new information. Updated: May 02, 2006. Document number: c00571422.

> **WARNING:**
>
> The information contained in this guide is HP and Channel Partner Use Only.

One of the goals in creating this guide was to capture and preserve PQ defect corner cases; these are isolated cases for specific print quality defects.

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## How to Properly Define PQ Issues

- Repetitive Defect

  Only refers to dots, dashes, or scratches that repeat at the interval. This does not include any horizontal or vertical lines.

- Banding

  Only refers to a horizontal line or horizontal hue shift, not dots, dashes, or vertical lines.

- Streaks

  Only refers to a vertical line. No dots, dashes, or horizontal lines.

## Repetitive Defect Distances

| Replacement Part | Roller | Distance |
|---|---|---|
| Print Cartridge | Developing cylinder | 34.3 mm (1.35 inches) |
| Print Cartridge | Primary charging roller - Print cartridge or tranfer roller (if the defect occurs in only one color, the defective part is the print cartridge; if the defect occurs in all colors, the defective part is the ETB. | 37.7 mm (1.48 inches) |
| Print Cartridge | Toner feed roller | 42.7 mm (1.68 inches) |
| ETB | Media attaching roller | 75.0 mm (2.95 inches) |
| Fuser | Fuser sleeve | 76.0 mm (2.99 inches) |
| Fuser | Fuser pressure roller | 81.0 mm (3.19 inches) |
| Print Cartridge | Photosensitive drum | 94.2 mm (3.71 inches) |

# Print Image Formation Troubleshooting

## Collecting Print Samples from U.S. Customers:

If the customer is experiencing any print quality issues, we need print samples. If we are replacing an ETB or toner cartridge, they get instructions with the Parts Recovery Program, that are to be crewed out with the part. If we are not replacing the part, we need print samples, in all instances.

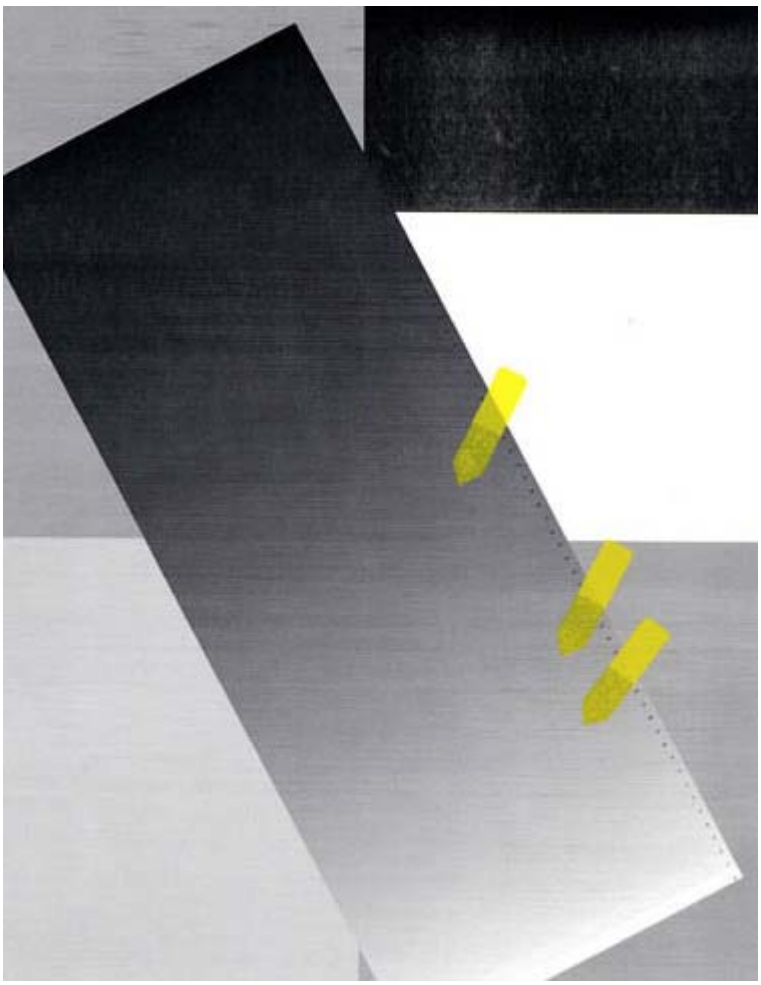
## Collecting Print Samples from Customers in the Rest of the World:

Please send any print samples that you receive through your normal escalation process. If the issue is not resolved and is not currently documented, collect the defective part as well, for analysis. The defect may be added to this PQ Guide. If the issue is not currently resolved, the print samples may be escalated through to division for further analysis and troubleshooting advice.

the image formation system is the central hub of teh printer. During image formation, an image of colored toner is formed and then fused onto the paper. The image formation system consists of the following physical components: four laser/scanner, four print cartridges, ETB, and fuser.

# Fine Line Segments

**Figure 1: Fine Line Segments**



**Defect description**

Fine horizontal lines/banding in the scan direction (similar to fine developer streaks, only horizontally creating a linen look).

**Contributing Condition**

Electrostatic breakdown between cartridge charge roller and the OPC drum creates areas that attract more toner on the OPC.

**Possible Causes**

If charge roller resistivity is too low (out of spec) then discharge results creating dark fine line segments.

**Troubleshooting and Suggestions**

Isolate problem color and replace corresponding cartridge. This may or may not help the defect. Can also try changing the humidity in the environment.

**Recommended Parts**

Toner cartridge. Replacing the cartridge may improve the banding, but cannot be guaranteed.

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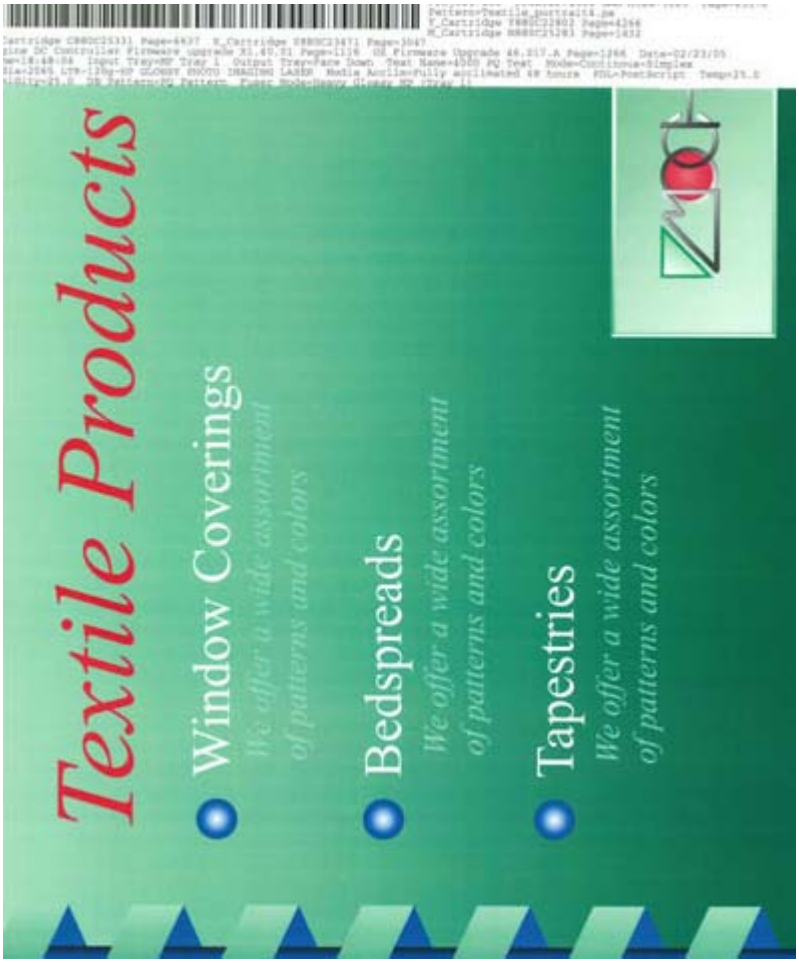
## Banding 5.88 mm pitch

**Figure 2: Banding, 5.88mm pitch**


Textile Products
Window Coverings
We offer a wide assortment of patterns and colors
Bedspreads
We offer a wide assortment of patterns and colors
Tapestries
We offer a wide assortment of patterns and colors

**Defect description**

Dark narrow horizontal bands typically visible in half tone colors that repeat at a small pitch spacing of 5.8 mm.

**Possible Causes**

Cartridge developer/ OPC drive gear tooth pitch irregularities.

**Troubleshooting and Suggestions**

- Print PQ Troubleshooting Suite to isolate color plane producing the defect.
- If seen in green (secondary), then replace the cyan main motor.
- If seen in red (secondary), then replace the magenta main motor.
- If seen in black, then replace the black main motor. The defect will not be seen in yellow.

**Recommended Parts**

Replace the Drum Drive Motor for the affected color plane.

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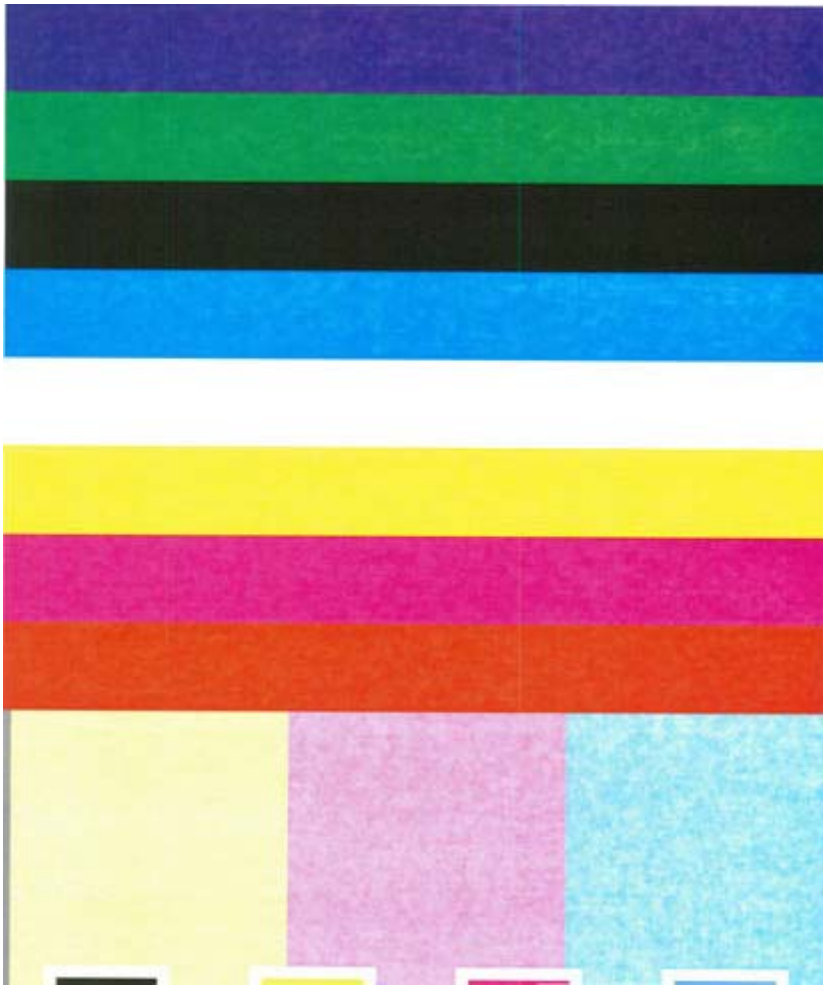
## Poor Transfer (Mottle)

**Figure 3: Poor Transfer Mottle**



**Defect description**

Halftone and solid fill toner areas do not have a uniform fill of toner but rather are missing toner which gives a blotchy uneven filled appearance.

**Possible Causes**

Either or both of the following contribute to poor transfer:

1. Poor development of toner from the developer roller to the OPC drum.

2. Poor or incomplete transfer of toner from the OPC drum to the paper. This can occur from using too thick or too thin of media.

**Troubleshooting and Suggestions**

1. Replace toner that is near end of life or has low status.

2. Make sure the media attraction roller (MAR) is not contaminated with toner and the ends of the roller shaft are properly seated into the holders on the ETB assembly.

3. Make sure the transfer rollers beneath the belt on the ETB (one for each color) are properly installed and seated.

4. Make sure the print mode matches the media type.

5. Try using different media. If the customer is using thick media, try using thinner media. If the customer is using thin of media, try using thicker media.

**Recommended Parts**

Replace cartridge if cartridge is near end of life. If MAR or transfer rollers need adjusting, make adjustments. Educate the customer on trying different media types.

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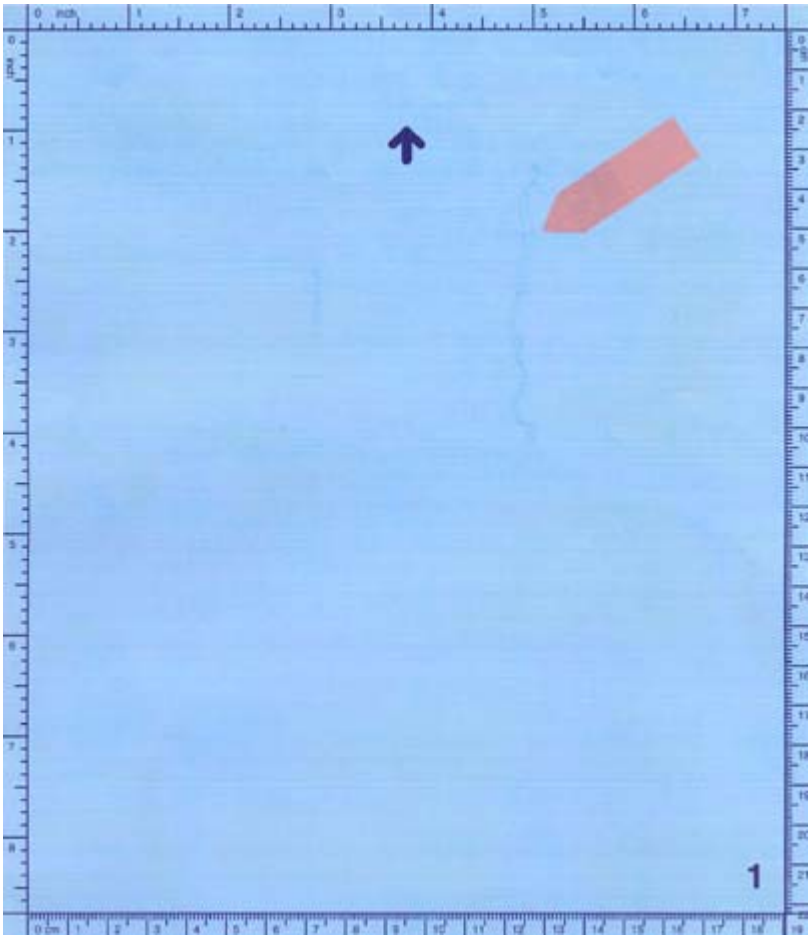
## Snail Tracks, Slugs (Fuser)

**Figure 4: Snail Tracks**




**Defect description**

Streaks that meander but are mostly parallel to the process direction. The streaks resemble a track mark made by a snail or to water droplets along the page.

**Contributing Condition**

Printing in High Temperature / High Humidity environment and/or with paper media which has been exposed to High Temperature / High Humidity environment.

**Possible Causes**

Acclimated media contains more moisture - causing it to curl or wave as it enters the fuser. The snail tracks are due to the difference in the toner density caused by the shape of the media.

**Troubleshooting and Suggestions**

1. Try a sealed, fresh ream of paper.
2. Use approved 75 $g/m^2$ or heavier media.
3. Decrease ambient humidity and temperature.

### Recommended Parts

None.

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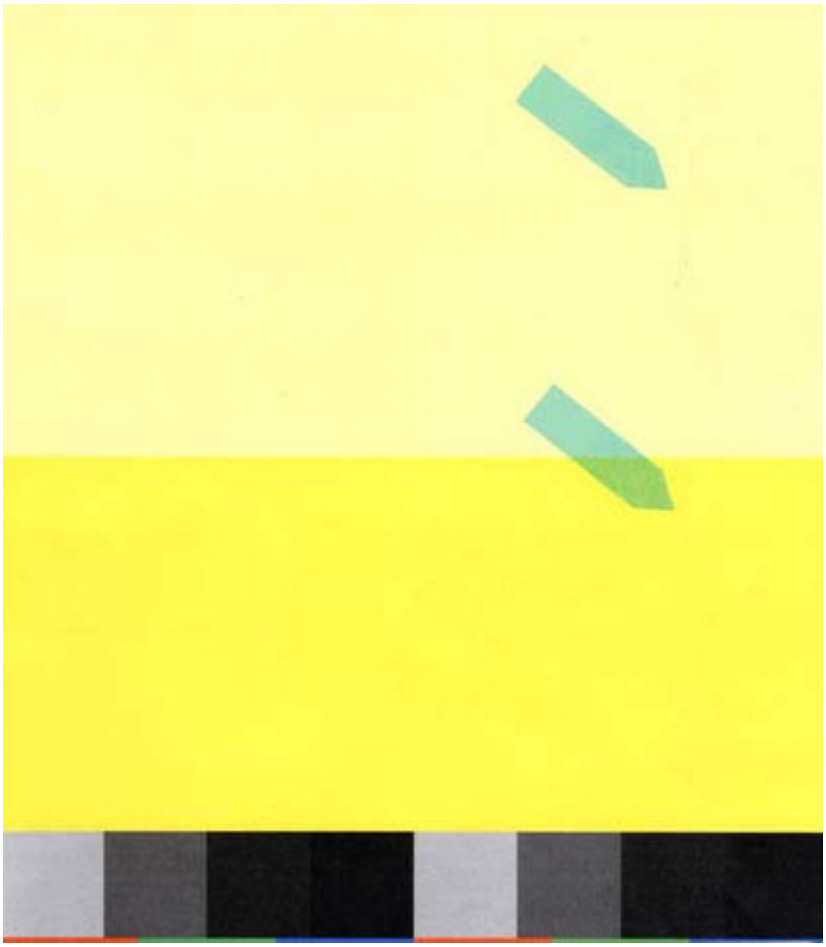
## Rain, dark, OPC 94 mm pitch

### Figure 5: Rain OPC



### Defect description

Small specks of toner that are visible at 94 mm pitch spacing.

### Possible Causes

OPC contamination causes toner to stick to the OPC surface, which does not get properly cleaned off by the cleaning blade. This creates small dots on the page that repeat at 94 mm. It is usually difficult for the customer to detect the 94 mm repetitive interval on the page.

### Troubleshooting and Suggestions

The rain can come and go as the contamination may be cleaned off over time. The defect seems to occur more frequently during long continuous print jobs.

**Recommended Parts**

Replace the cartridge.

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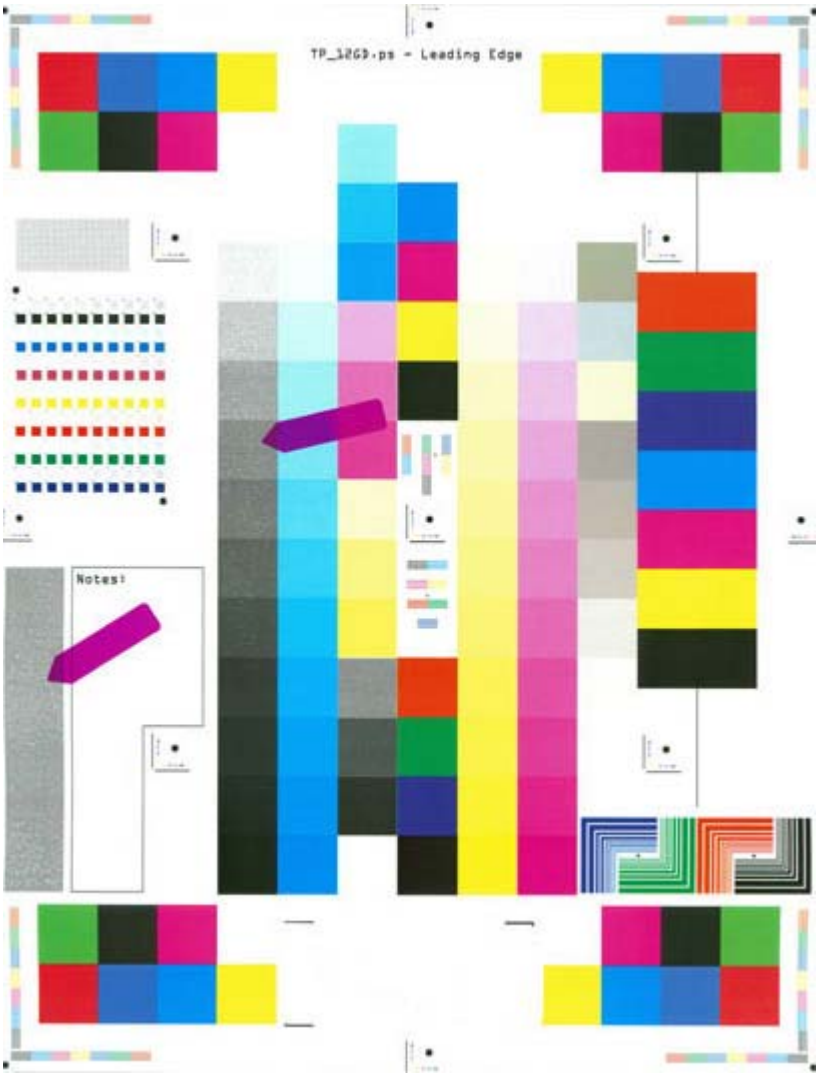
## Rain, white, OPC 94 mm pitch

**Figure 6: Rain white**




**Defect description**

Small specks of missing toner that are visible on a solid-fill area at 94 mm pitch spacing.

**Possible Causes**

OPC contamination causes toner to stick to the OPC surface, which does not get properly cleaned off by the cleaning blade. This creates small white dots on a solid filled area on the page that repeat at 94 mm. It is usually difficult for the customer to detect the 94 mm repetitive interval on the page.

**Troubleshooting and Suggestions**

The rain can come and go as the contamination may be cleaned off over time. The defect seems to occur more frequently during long continuous print jobs.

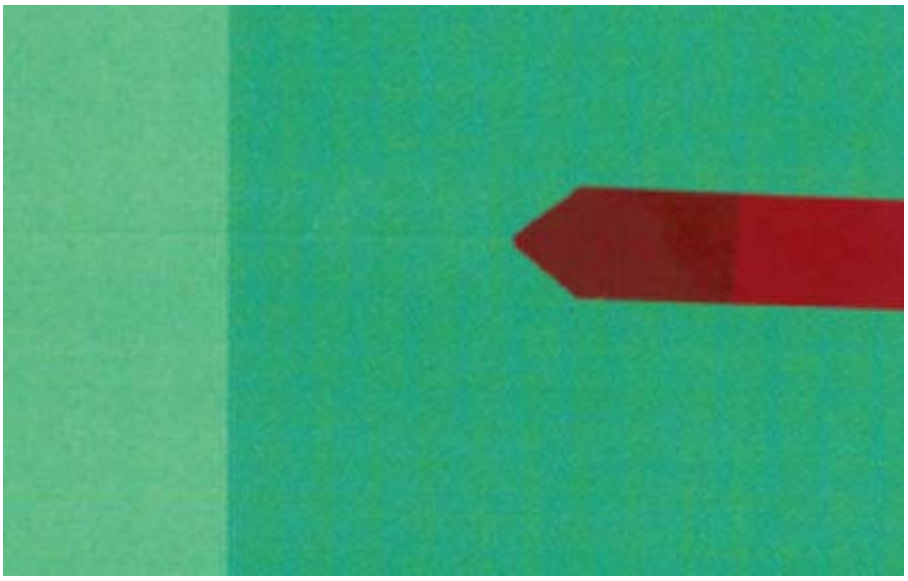
**Recommended Parts**

Replace the cartridge.

top

## Banding, OPC - 94 mm pitch, sharp bands

**Figure 7: Sharp Band**



**Defect description**

Horizontal sharp light lines appear at a 94 mm pitch spacing.

> **NOTE:**
>
> Dark line appears below the light line in this defect.

**Possible Causes**

Toner additives and/or foreign materials adhere to the contact area of the OPC cleaning blade and the OPC drum surface when the drum is stopped. This can be caused when the OPC has not rotated for several minutes. After the OPC rotates, the defect does go away after a few pages and will stay

away during continuous printing.

**Troubleshooting and Suggestions**

Customer can set front control panel to turn on 'Pre-rotations'. Go to **Configure Device**, then go **Print Quality**, then **Optimize**. This will avoid the mark, but it will cause a slower first page out (20 seconds), and will use up cartridge life.

**Recommended Parts**

None. Do not replace cartridge, this will not help.

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## Offset, Fuser / Electrostatic

**Figure 8: Fuser Offset (Electrostatic offset)**

153,51,102 - Plum *****
0,204,255 - Sky Blue **
0,255,0 - Bright Green
255,0,255 - Pink *****
128,0,128 - Violet ****
51,102,255 - Light Blue
51,153,102 - Sea Green
255,0,0 - Red *********
102,102,153 - Blue Gray
0,0,255 - Blue *********
0,128,128 - Teal ********
0,128,0 - Green *******
128,128,0 - Dark Yellow
255,102,0 - Orange ****
128,0,0 - Dark Red *****
51,51,51 - Gray 80% ***
51,51,153 - Indigo *****
0,0,128 - Dark Blue ****
0,51,102 - Dark Teal ***
0,51,0 - Dark Green ****
51,51,0 - Olive Green *
153,51,0 - Brown ******
0,0,0 - Black **********
153,51,102 - Plum *****
0,204,255 - Sky Blue **
0,255,0 - Bright Green
255,0,255 - Pink *****
128,0,128 - Violet ****
51,102,255 - Light Blue
51,153,102 - Sea Green
255,0,0 - Red *********
102,102,153 - Blue Gray

**Defect description**

Text and image ghost are visible at 76 mm pitch from original text or images.

**Contributing Condition**

Printing in duplex mode and/or Low Temperature/Low Humidity environment (can also occur in other environments as well)

**Possible Causes**

Toner is electrostatically attracted from the paper to the fuser sleeve and then redeposited onto the paper after one circumferential rotation of the sleeve (76 mm).

**Troubleshooting and Suggestions**

1. Use Fresh unpacked Media.

2. If printing with rough paper, change fuser mode from rough to normal via the front control panel.

**Recommended Parts**

None

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## Gloss Band / Hot Offset Fuser

**Figure 9: Gloss Bands**

**Defect description**

A wide horizontal band with a higher gloss level (more shine) appears within 76 mm from the leading edge of the media. Appears in solid fill colors printed in plain and gloss modes.

**Contributing Condition**

Hot offset occurs on glossy media because the temperature of the fuser pressure roller is higher when intermittently printing short jobs over a long period of time.

**Possible Causes**

The fuser sleeve surface temperature is hotter for the initial rotation (76 mm of paper travel) but then becomes less hot as the fuser heater can not maintain the initial temperature due to the low thermal mass of the instant on fuser. The increased gloss corresponds to the hotter sleeve temperature during the initial 76 mm rotation.

**Troubleshooting and Suggestions**

1. Try printing a couple of pages prior to print job to allow instant on fuser to stabilize fusing

temperature.

2. Customer can also reduce the fuser temperature to reduced via the control panel. This may change the overall gloss level of printed documents.

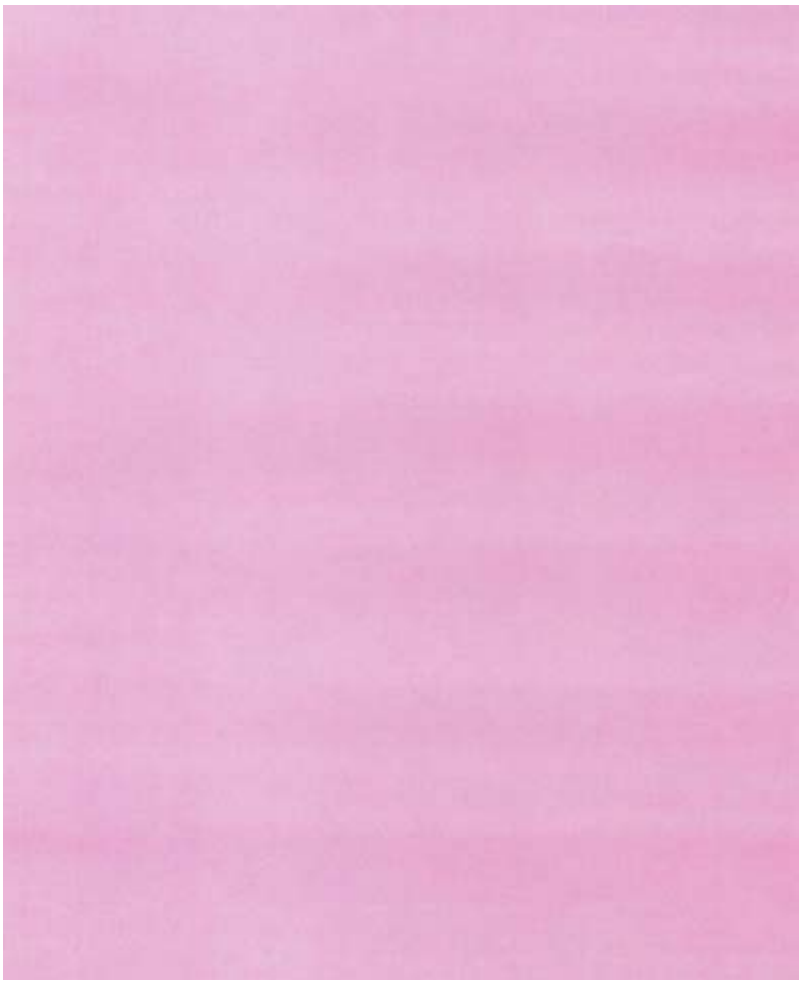
**Recommended Parts**

None.

top

## Banding CMY developer hue shift 38.5 mm pitch

**Figure 10: Banding 38.5 mm developer hue shift**



**Defect description**

Dark horizontal bands typically visible in C,M & Y halftone colors, that repeat at 38.5 mm developer roller pitch.

**Possible Causes**

This is a toner cartridge problem with two causes:

1. The developer roller is non-concentric.

   and/or

2. The developer roller is not perfectly round.

**Troubleshooting and Suggestions**

Print the PQ Troubleshooting Suite to identify which print cartridge is causing the defect.

**Recommended Parts**

Replacing the print cartridge may help; however, this defect may be evident in a replacement cartridge.

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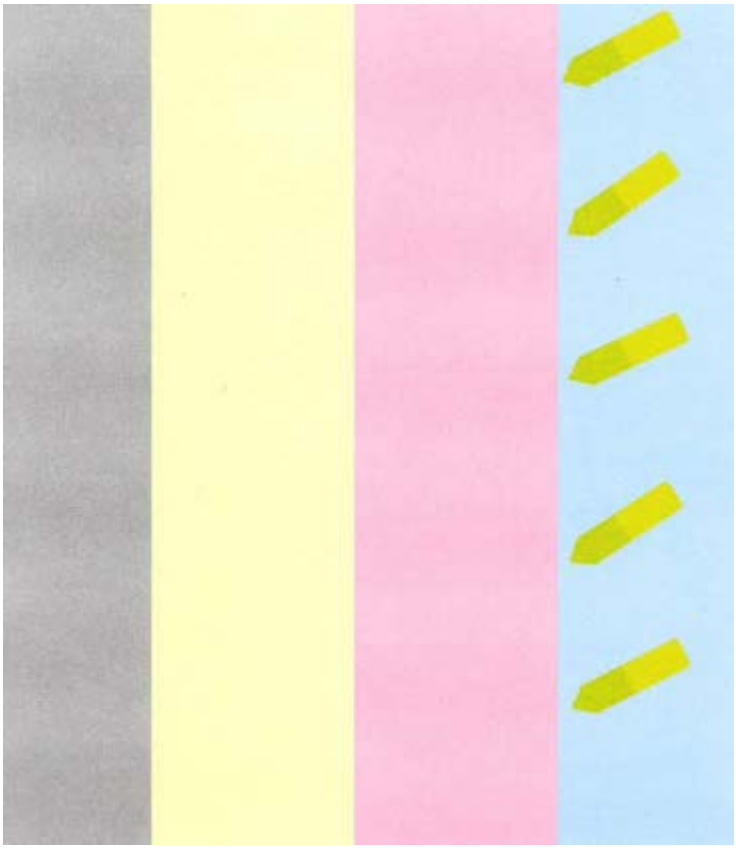
## Banding K developer hue shift 34mm pitch

**Figure 11: Banding 34 mm black (K) - Developer hue shift, sample 1**



**Defect description**

Dark horizontal bands typically visible in K halftone colors that are repeating at 34 mm developer roller pitch.

**Possible Causes**

This is a toner cartridge problem with two causes:

1. The developer roller is non-concentric.

   and/or

2. The developer roller is not perfectly round.

**Troubleshooting and Suggestions**

Print the PQ Troubleshooting Suite to identify which print cartridge is causing the defect.

**Recommended Parts**

Replacing the print cartridge may help; however, this defect may be evident in a replacement cartridge.

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## Background Toner (Front side)

**Figure 12: Background toner**

**Defect description**

Very light hues of color(s) on non-printed areas of the page.

**Contributing Condition**

Continuous printing stirs toner and degrades the charge properties. Also the toner in cartridges that are near end of life have charge properties that are not optimal.

**Possible Causes**

This is typically a toner cartridge problem caused by positive 'wrong sign' toner being attracted to the media. This defect can be found most often on glossy media and at cartridge end of life after printing low coverage.

**Troubleshooting and Suggestions**

1. Replace cartridge w/ high life or near end of life.
2. Avoid higher resistivity or glossy papers.
3. Try using an sealed, fresh package of paper.
4. Try using the background reduction modes 1 and 2 from the front display panel.

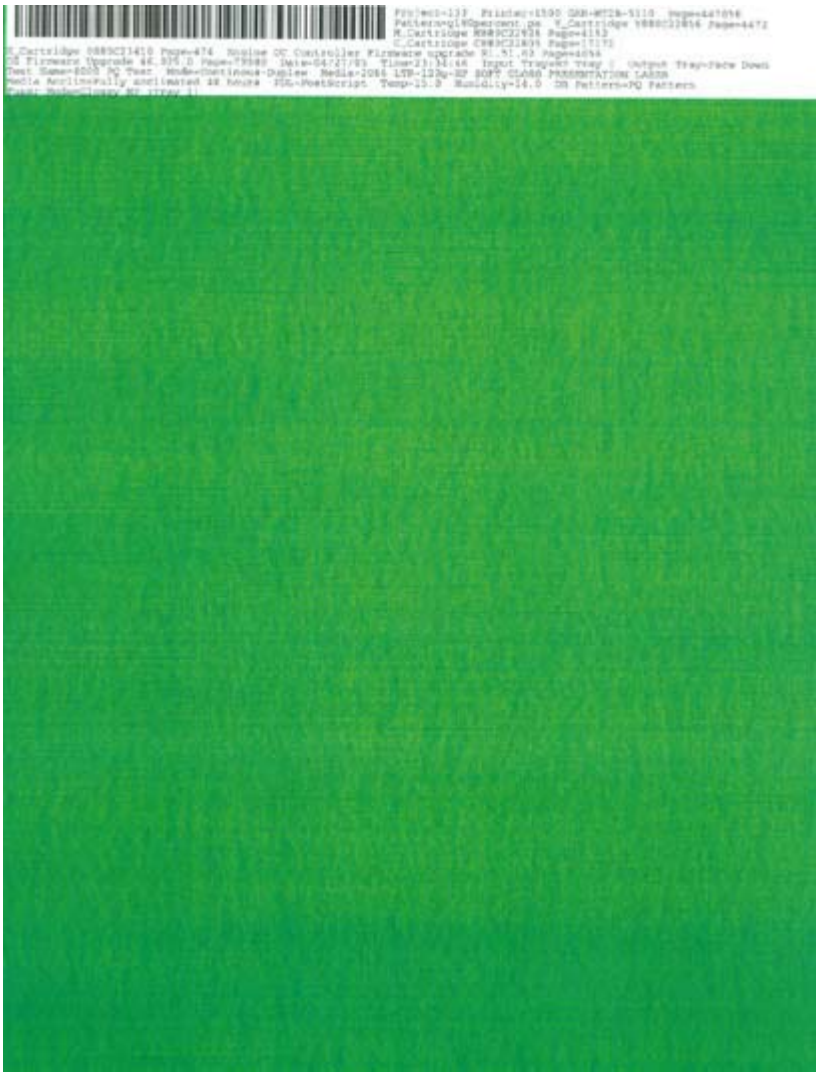
**Recommended Parts**

Replace cartridge if cartridge is near end of life. Try another media type.

top

## Re-Transfer, Cyan

**Figure 13: Re-Transfer, Cyan**



**Defect description**

Cyan color halftone and solid fill toner areas do not have a uniform fill of toner but rather are missing cyan toner which gives a blotchy uneven filled appearance. This produces a mottled look, especially in solid green fills but also occasionally shows up in solid red and solid blue fills. The mottling is on a scale of perhaps 1 to 3 mm. The phenomenon is worse on glossy media, especially on the second side of a duplex page. It is worse late in cyan cartridge life and may be aggravated by a yellow cartridge that is fairly new. Environment other than normal (For Example: Low temperature / low humidity or high temperature / high humidity may also produce more retransfer.

**Contributing Condition**

Continuous printing stirs toner and degrades the charge properties. Also the toner on cartridges that are near end of life have charge properties that are not optimal.

**Possible Causes**

The transfer order for the colors is Y, C, M & K. Cyan toner on the paper surface is attracted back (retransferred) to the OPC drums of the M & K cartridges as the paper is transported toward the fuser. Contributing factors are duplex, media and media condition, environment, toner charge, and cartridge life.

**Troubleshooting and Suggestions**

Transfer settings have been fine tuned on the HP CLJ4700 & 4730 MFP to reduce retransfer. Additional changes to transfer settings may have the undesirable side effect of producing poor transfer. In addition to transfer settings, the environmental sensor in the printer is also used to adjust transfer settings to reduce retransfer.

Poor transfer is evident mainly on heavier media and will show as a mottled appearance on primary color, heavy fill areas.

A retransfer optimize mode was created and is accessible through the front panel. It may produce a higher incidence of poor transfer (especially in solid primaries), but it may help reduce mottle in solid secondary colors such as green and red.

**Recommended Parts**

Further improvement is not possible at this time. For customer satisfaction, however, a one-time cartridge replacement may need to be performed. However, this is not advisable since it is a temporary fix (it's not a problem with the toner cartridge). It may not be possible to eliminate this problem.

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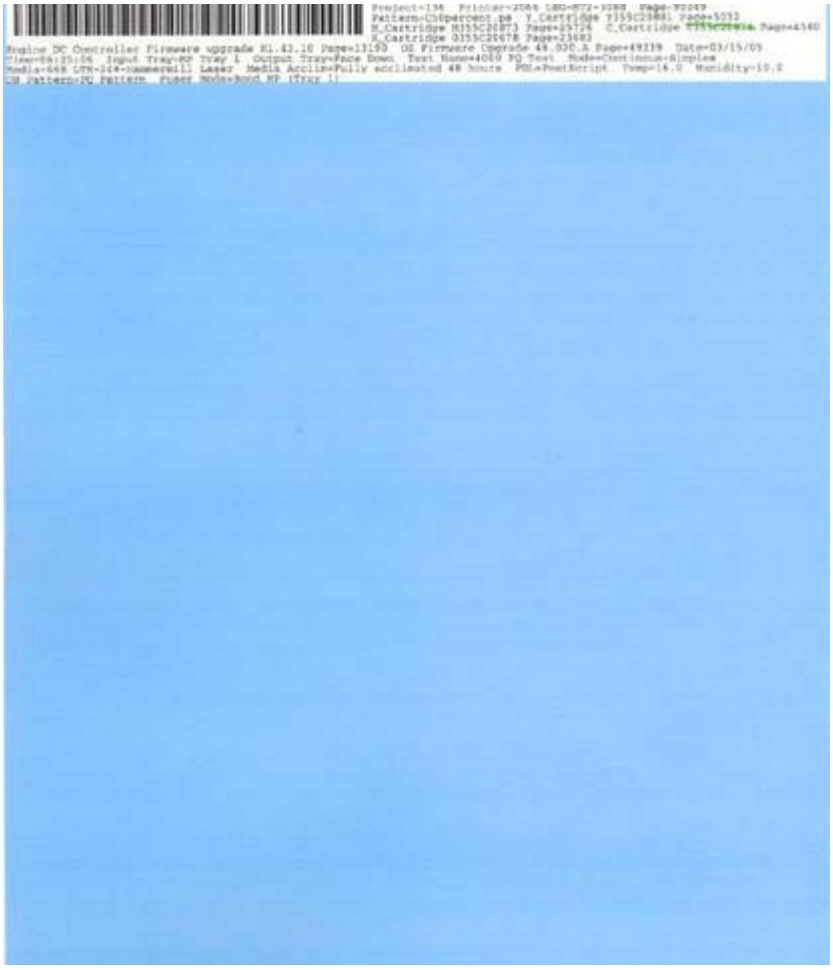
## Random Bands

**Figure 14: Banding - Random bands**



**Defect description**

Dark horizontal bands visible in halftone colors that occur at random pitch spacings.

**Possible Causes**

Toner build-up on the developer roller and/or OPC drum causes random impulse banding.

**Troubleshooting and Suggestions**

The defect should be less visible at the beginning of cartridge life. Replacing the cartridge may improve the banding, but cannot be guaranteed.

**Recommended Parts**

Toner cartridge. Replacing the cartridge may improve the banding, but cannot be guaranteed. The defect should be less visible at the beginning of cartridge life.

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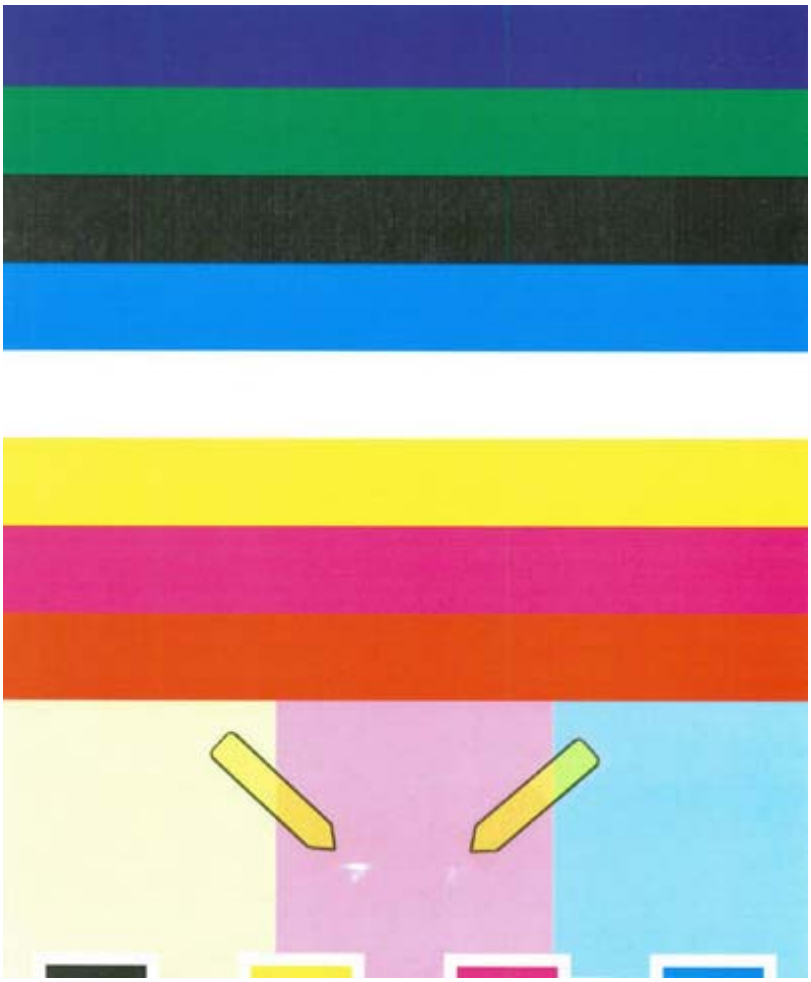
## Snake Bite

**Figure 15: Snake bite, sample 1**



**Defect description**

Two irregularly shaped light spots or toner voids that can vary in size from 1 to 4 mm. The two spots are in the scan direction and are spaced 26 mm apart and 55 mm from the leading edge of the page.

**Contributing Condition**

Occurs only when printing from tray 1. Is worse in a High Temperature / High Humidity environment with acclimated media.

**Possible Causes**

Caused by media deformation/contamination from the tray 1 pick roller and lift plate contact when feeding.

**Troubleshooting and Suggestions**

Use freshly opened media. Print from another tray.

**Recommended Parts**

None.

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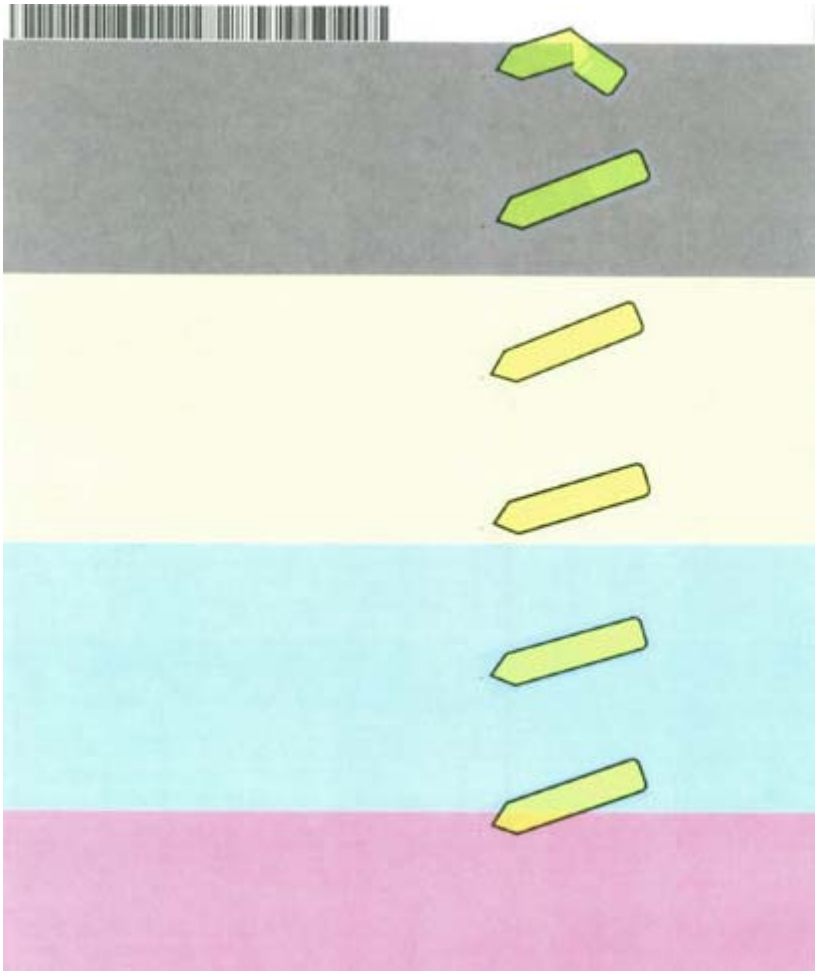
## 38 mm Repetitive Spot (Label Adhesive)

**Figure 16: Repeating dot at 34 mm or 38 mm - charge roller adhesive**



**Defect description**

Defect shows as small irregularly, shaped dots repeating down the page at a 38 mm interval (OPC charge roller).

**Possible Causes**

Customer may be printing with adhesive labels that are either defective, out of spec, or previously used. The adhesive gets transferred to the OPC and then to the charge roller.

**Troubleshooting and Suggestions**

Print the PQ Troubleshooting Suite and examine the white page. Identify what color dot is repeating down the page to identify which print cartridge is causing the defect. If unable to determine color, remove one cartridge at a time (using 'disable cartridge. check' feature) to isolate the cartridge.

**Recommended Parts**

Educate the customer that some brands of labels are more prone to create this problem than others, and that labels cannot be 'reused' or fed through the printer more than once. Replace the cartridge, 'one time only' (due to this issue) for customer satisfaction.

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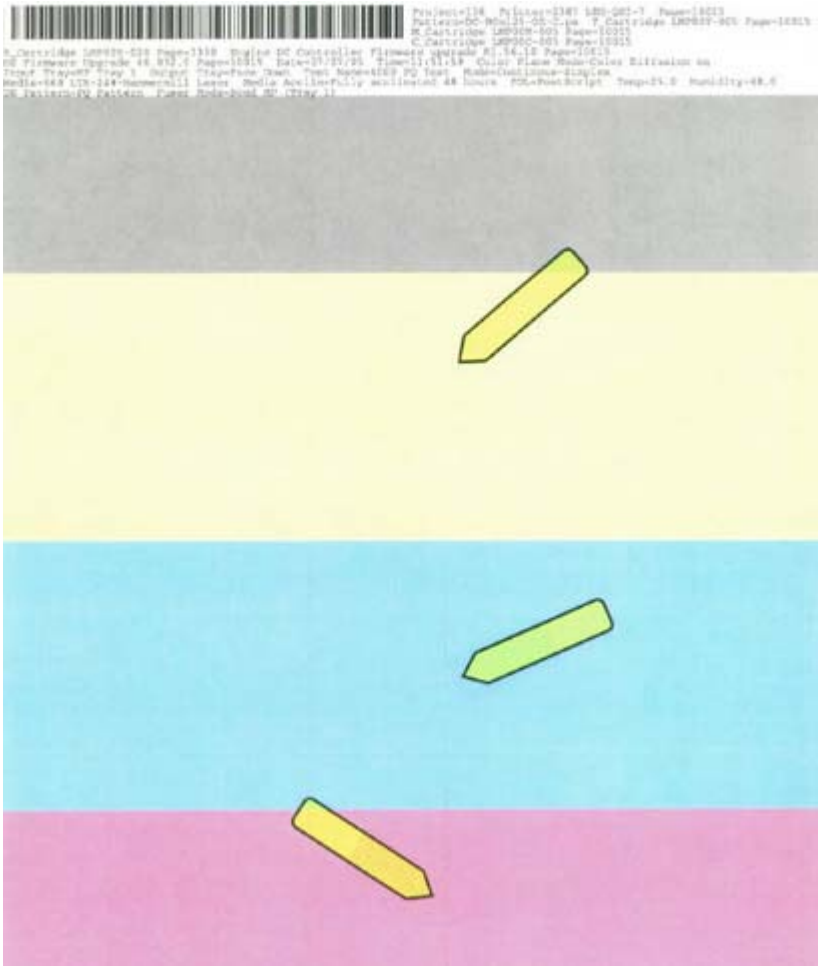
## Cleaning Blade Streaks

**Figure 17: Streak, cleaning blade**



**Defect description**

Dark vertical lines that are usually continuous all the way down the page. The line is the color of the waste toner from the respective cartridge. The dark line will show up over the top of solid filled areas as well as non-printed areas (including the margins).

### Contributing Condition

Cold temperature. Printing in dusty environments and starting the printer below 15$^{o}$ Centigrade.

### Possible Causes

There are two reasons for this:

1. A foreign particle can become trapped in the cleaning and create an opening for the waste toner to streak onto the page. A foreign particle can also cut a notch into the cleaning blade and cause the same result.

2. Cold temperatures cause the cleaning blade to be stiffer and cause small openings to occur between the blade and OPC surface.

### Troubleshooting and Suggestions

Print the PQ Troubleshooting Suite and look at the vertical streaks on the blank page. Replace the defective cartridge. Reprint the PQ Troubleshooting Suite to verify the correct cartridge was replaced. If the customer has the printer in a cold environment, suggest the printer be run in a warmer temperature. The defect can come and go, as either the temperature is raised or the foreign particle works its way out.

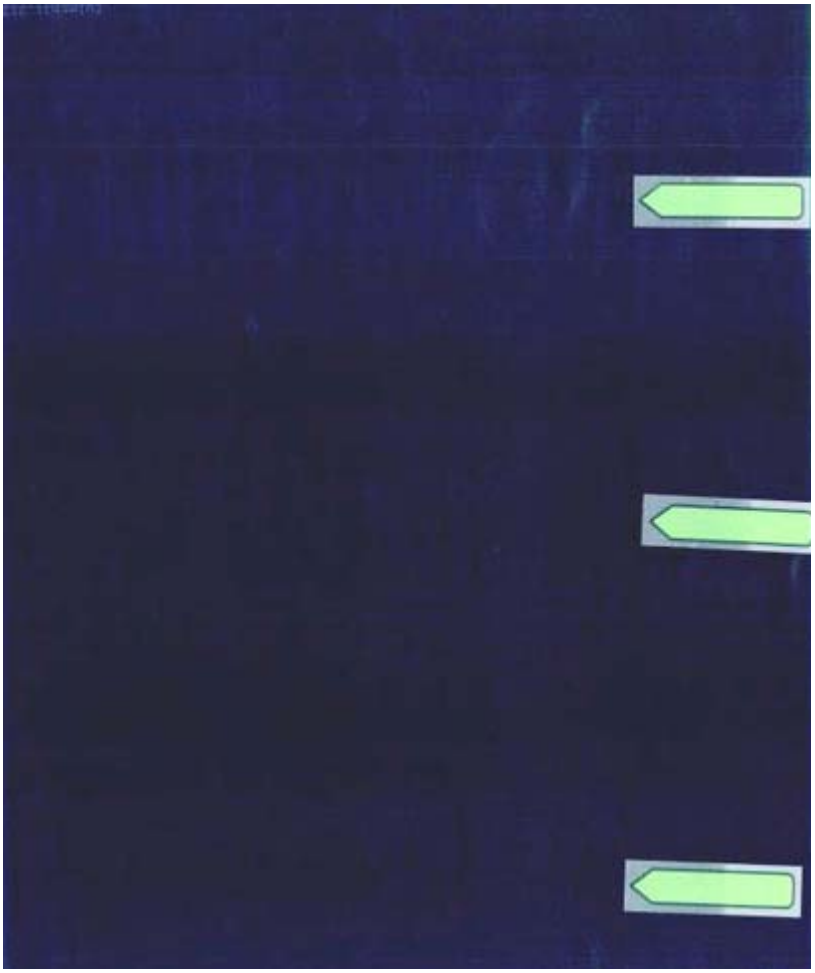
### Recommended Parts

Replace the toner cartridge if needed.

top

## Marks across page (Fuser 110 Volts in 220 Volts)

**Figure 18: Marks across page (fuser)**



**Defect description**

Marks appear as short segments that are grouped together as a band. This defect occurs only if wrong fuser voltage is being used (When using a 110 Volt fuser in a 220 Volt engine.)

**Possible Causes**

Using the wrong fuser voltage impacts the fusing temperature and fuser sleeve bumps develop causing the 'Marks.' The defect will be noticed with Glossy media.

**Troubleshooting and Suggestions**

Check if the customer is using the correct fuser voltage with the correct engine voltage.

110 Volt fuser has a white Serial number Label.

220 Volt Fuser has a pink Serial number Label.

**Recommended Parts**

New Fuser (with the correct voltage).

top

## Backside Tick Marks (Fuser)

**Figure 19: Backside Tick Marks, Simplex**

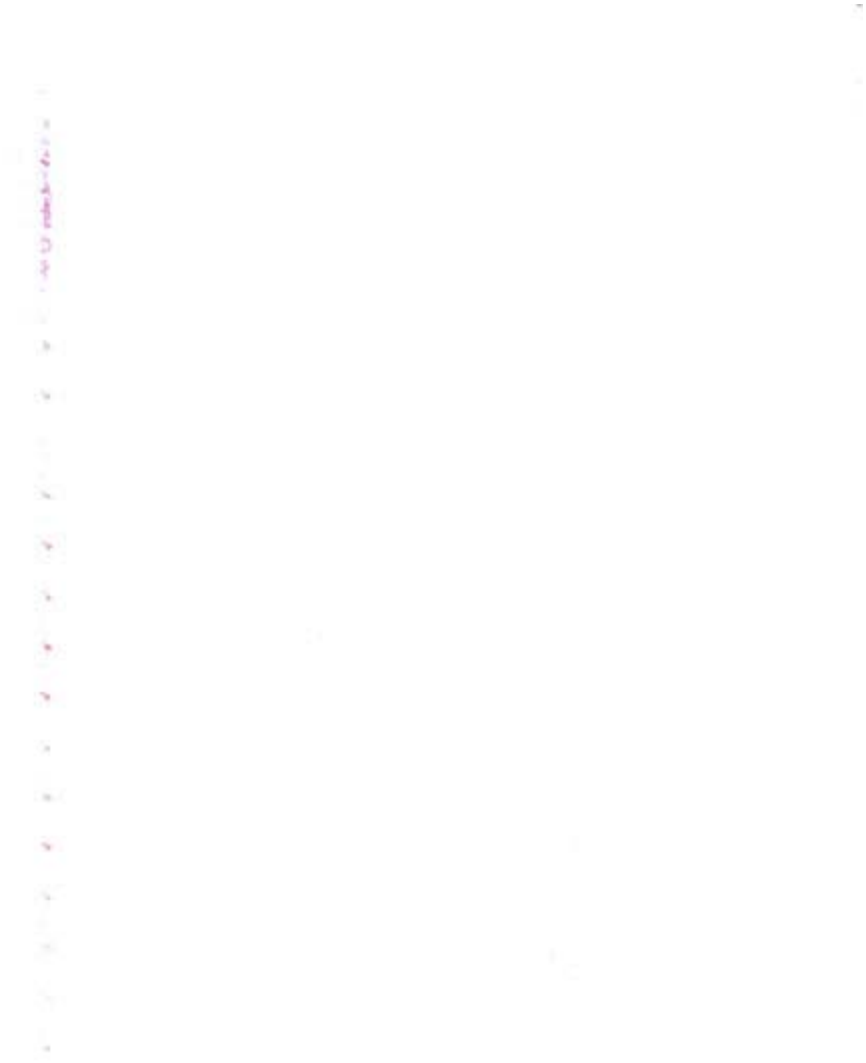
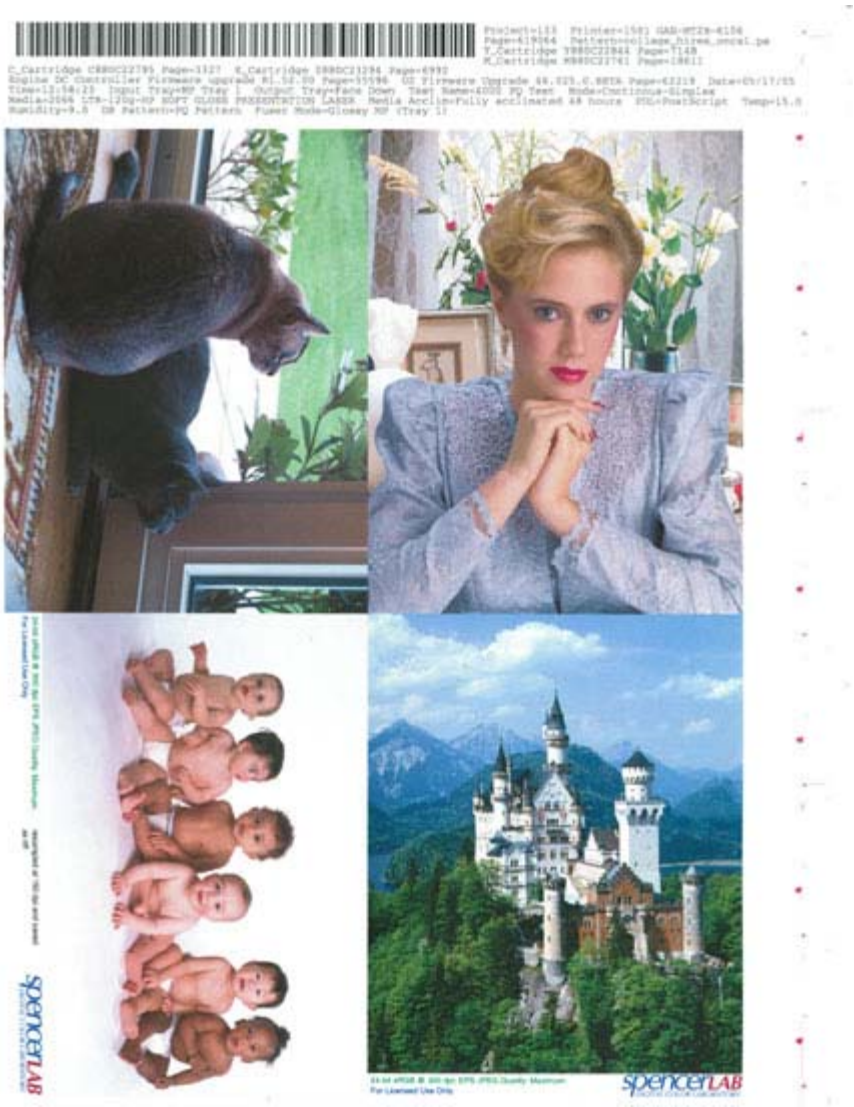


**Figure 20: Backside Tick Marks, Duplex**



**Defect description**

Tick marks aligned in one or two streaks on the backside of the page. This usually occurs on glossy duplex pages.

**Possible Causes**

Continuous printing with envelopes or with narrow media could create cuts on the Fuser Pressure Roller.

**Troubleshooting and Suggestions**

Verify with the customer if cuts are seen on the pressure rollers and if they have been printing with envelopes and/or with narrow media.

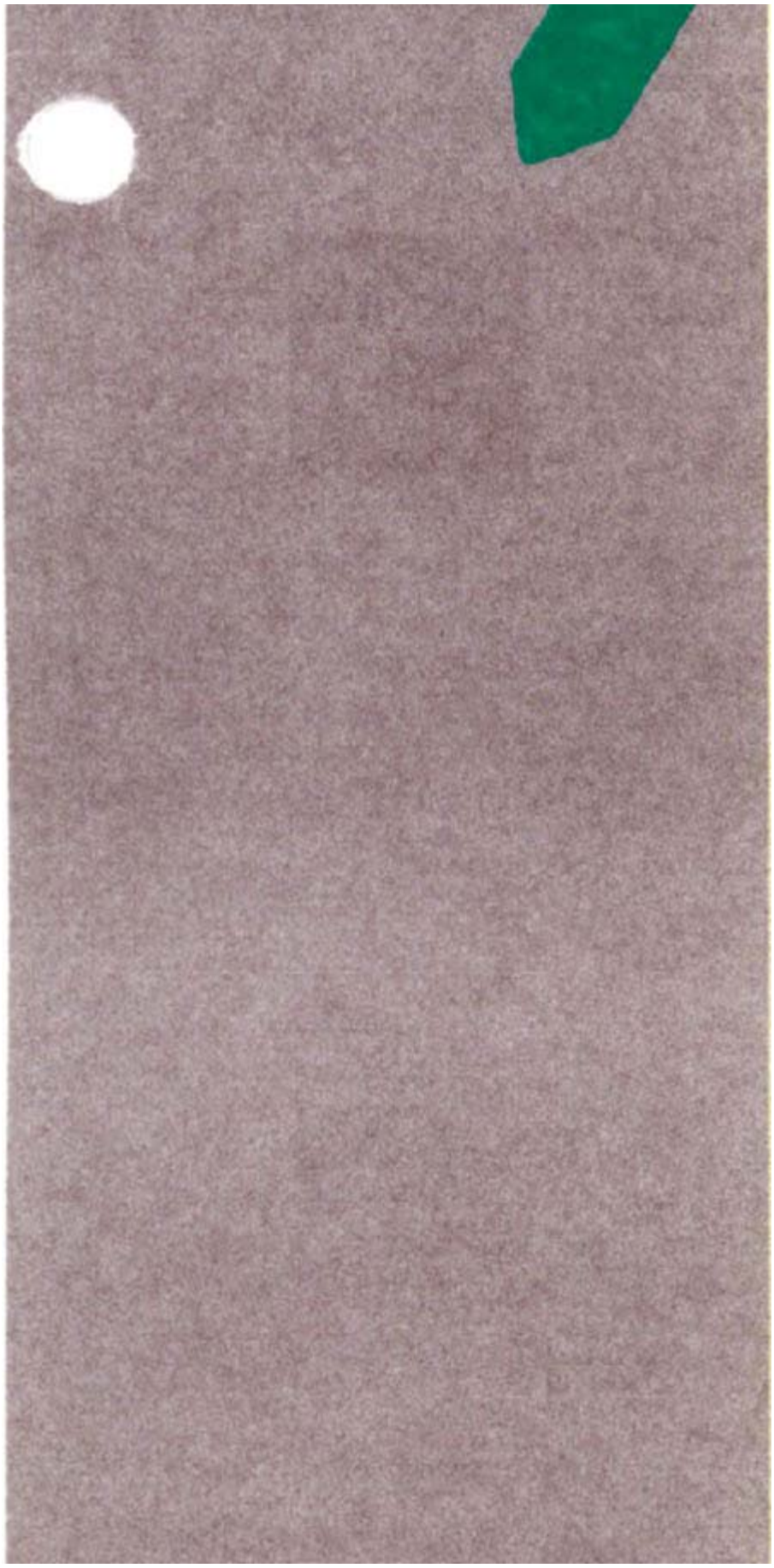
**Recommended Parts**

New fuser.

top

## OPC (94 mm) Ghosting

**Figure 21: Ghosting, OPC**



**Defect description**

OPC ghosting is when a printed object is discernable further down the page at 94 mm offset from original.

**Possible Causes**

Photoconductive drum ghost can be caused in different ways:

1. **Incorrect transfer settings**: This can occur by running media in an incorrect mode. It may also occur if there are hardware problems with the transfer circuitry (such as the spring contacts to the ETB).

2. Some ghosting may occur on heavy glossy media, especially in high temperature, high humidity environments. This is a consequence of transfer settings being optimized to reduce re-transfer.

3. **Erase failure**: The printer has a LED that shines into a light pipe which illuminates the photoconductive drum as it rotates. Anything that stops light from reaching the photoconductive drum will cause a ghost. This could occur by light pipe breakage, hardware failure of the LED or associated circuitry, or by obstruction of the light between the engine and the light pipe (by toner, or by a broken mechanism).

**Troubleshooting and Suggestions**

1. Attempt to isolate which cartridge or cartridges are producing the ghosting image. (Disable cartridge check function can help facilitate this.)

2. Check to see if the light pipe is in any way dislodged from its normal position on the cartridge.

3. Try using a soft tissue to clean any toner, dust or debris accumulation away from the light emitting length of the light pipe.

If the customer is using heavy glossy media (or heavier, slicker media) in a high temperature, high humidity environment, this has been found to be one of the most frequent causes, so ask the customer to try different media (either lighter or less glossy). Lastly, check the contacts between the ETB and the engine - the copper contacts on the left side of the ETB and the spring contacts to the left of the cartridges.

**Recommended Parts**

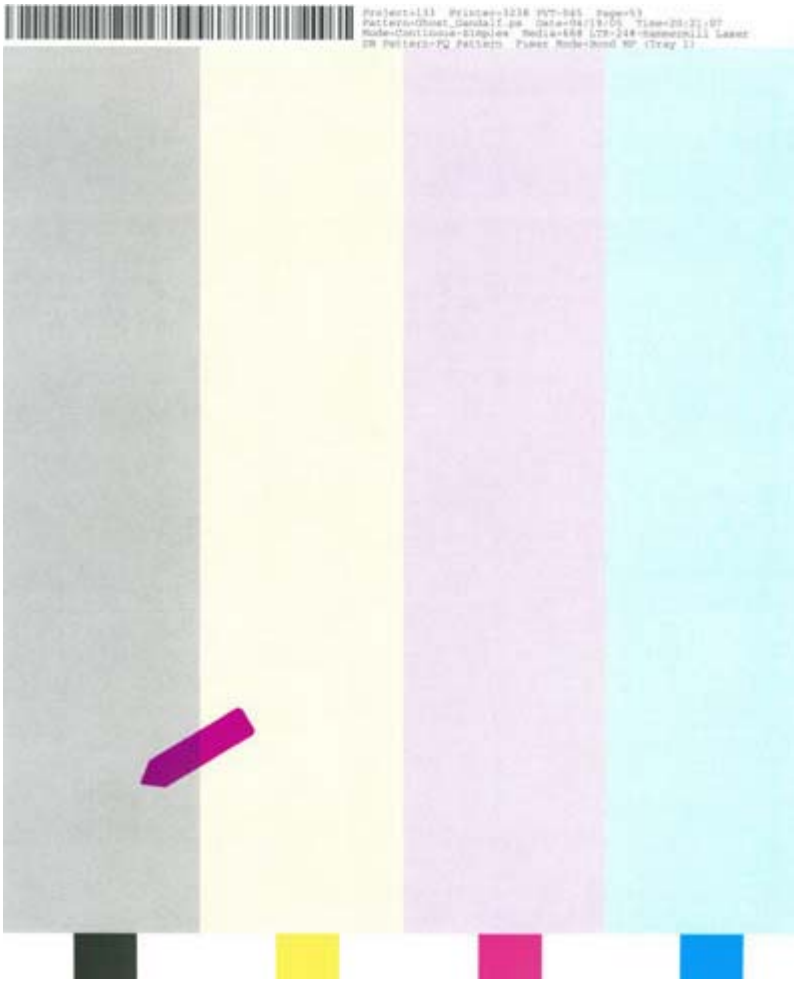
As a last resort, replace the cartridge responsible for the ghosting.

> **NOTE:**
>
> A cartridge may not fix the problem and if the problem occurs with the new cartridge, the printer may require on-site diagnosis.

top

# Developer (38/34 mm) Ghosting

**Figure 22: Ghost, developer 01**



## Defect description

Developer ghosting is when a printed object is discernable further down the page. For ghosting caused by the developer roller, the repeated image appears at 38 mm pitch for cyan, magenta, and yellow, and 34 mm for black.

## Possible Causes

Developer ghosting is caused by the charge characteristics of the toner. Most often it is seen as a ghost of a solid fill cut-out (like a ghost of white letters in a solid blue field). Blue may produce worse results than other colors. It is worse early in cartridge life (first few hundred pages) but may persist. Results may be better on the first page of a job than on subsequent copies.

## Troubleshooting and Suggestions

1. Check the printer's transfer settings, including print and optimize modes, as this can have a significant effect on cartridge ghosting.

2. Perform **Full Calibrate Now**.

3. Alternating high coverage and low coverage pages in a job may help.

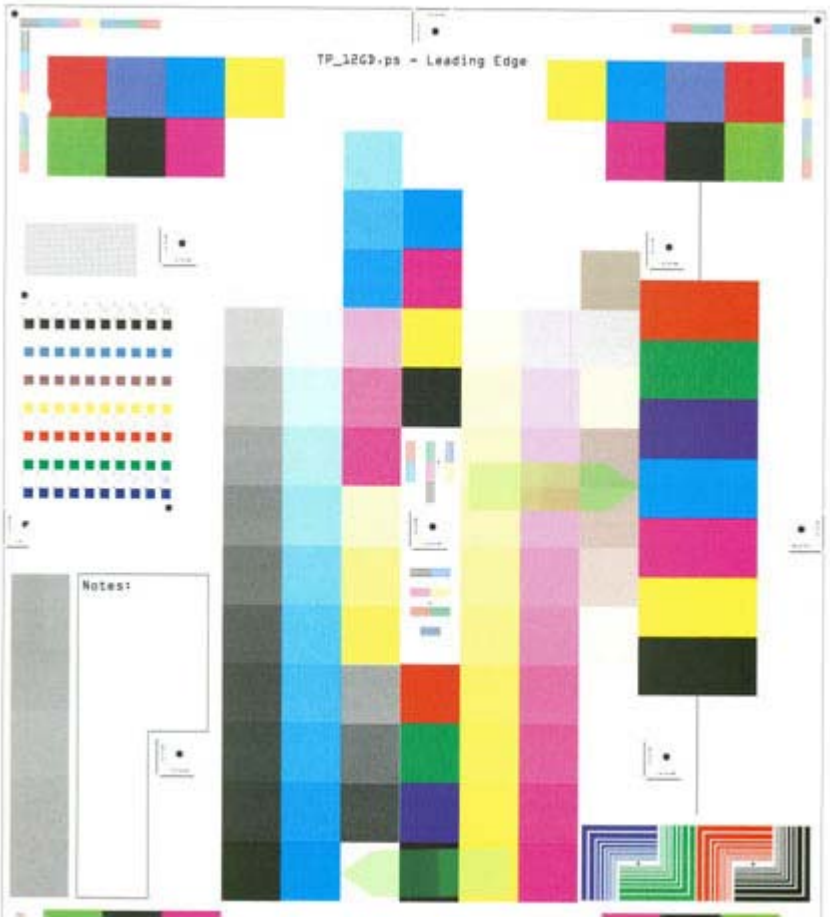
**Recommended Parts**

After identifying ghosting cartridge, replacing the cartridge may be tried one time only as this may not solve the problem.

top

## Streaks, fine developer

**Figure 23: Streaks, fine developer**




**Defect description**

Thin streaks print in halftone areas. These lines may appear in one color (cyan), or may appear in any combination of colors (CMYK).

**Possible Causes**

This issue is seen towards the end of the cartridge's life. Toner has accumulated on the cartridge's

doctor blade. The purpose of the doctor blade is to create an even level of toner onto the developing roller. Since the doctor blade no longer has an even surface, uneven amounts of toner are placed on the developing roller, then transferred onto the OPC.

**Troubleshooting and Suggestions**

1. Print the PQ troubleshooting pages from the printer to verify which cartridge(s) is showing the vertical lines.

2. Print the supplies status page to gauge the percent life remaining for each infected cartridge. If any cartridges are reading `order supplies` (below 20%), recommend that the customer replace the cartridge. Otherwise, replace the cartridge under warranty.

**Recommended Parts**

Replace only the affected print cartridge(s).

top

## Partial or missing color plane

**Figure 24: Partial or missing color plane, typical of misaligned gears on main drive assembly**

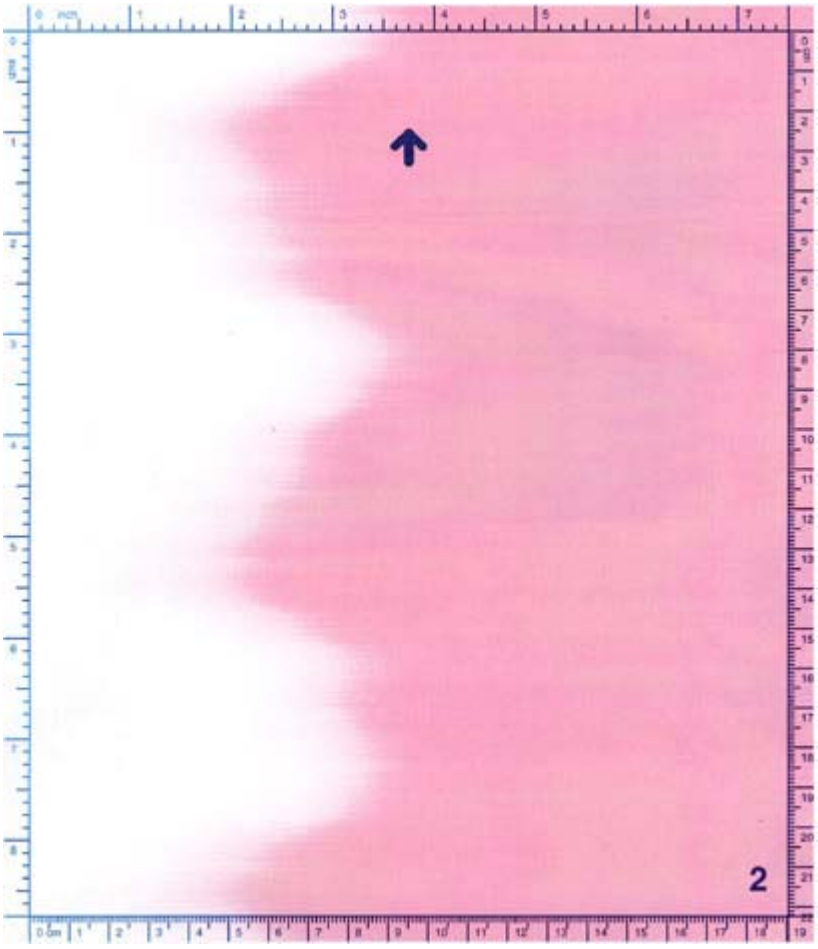


**Figure 25: Partial or missing color plane, black - Config Page, typical of misaligned gears on the main drive assembly**

**1 - Paper motion.**

**2 - Faded blue (No black).**

**Figure 26: Faded yellow, typical of misaligned cable cover**

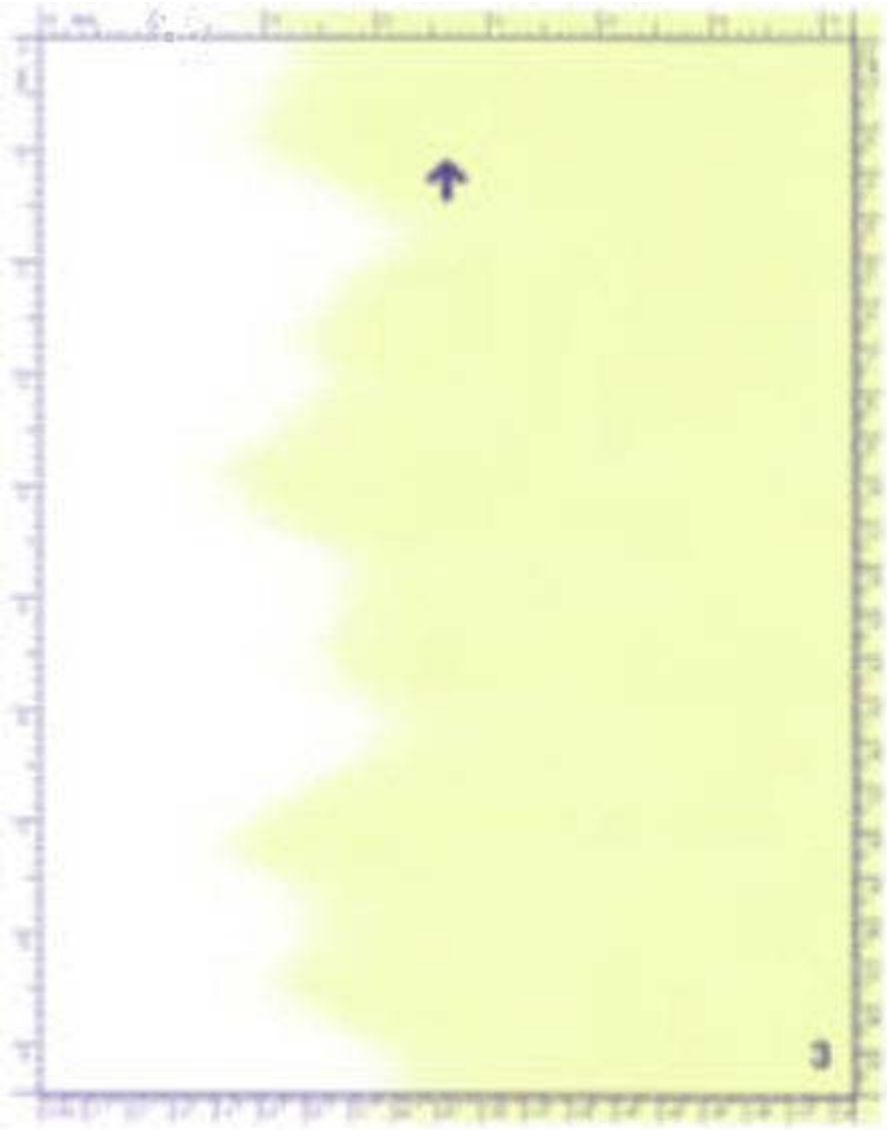
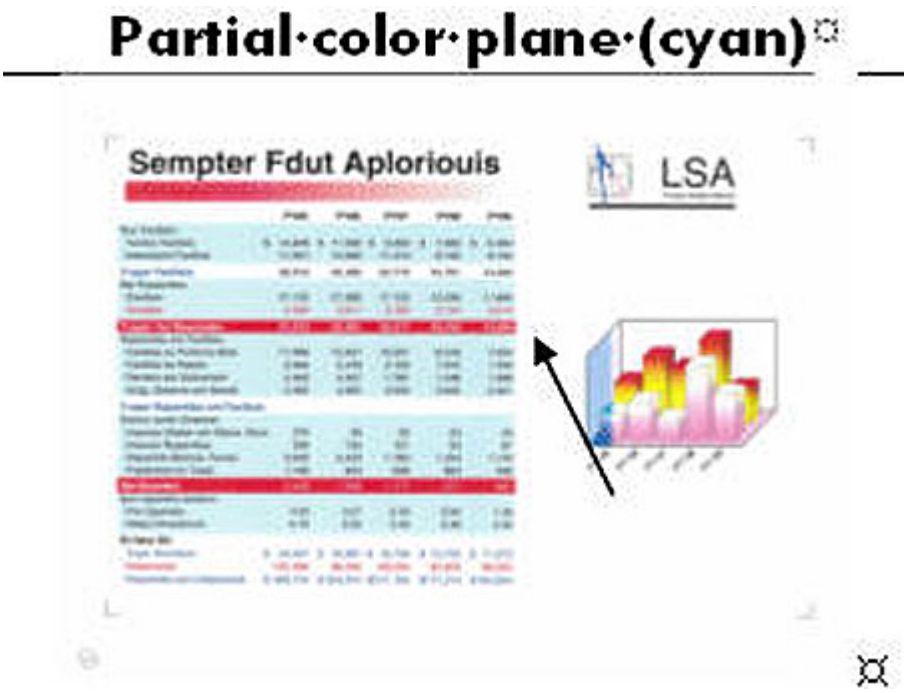
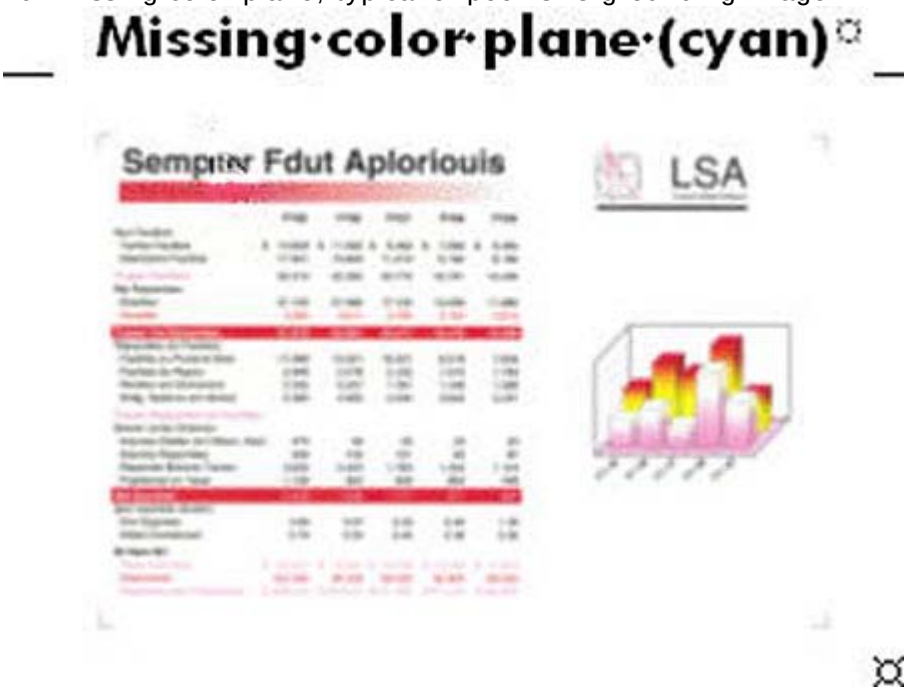


**Figure 27: Partial color plane, typical of poor OPC grounding image**




Full Missing color plane, typical of poor OPC grounding image




**Defect description**

Images appear to change color or completely fade away, either from side to side or top to bottom.

**Possible Causes**

1. OPC grounding spring not making adequate contact. In this case, additional defects that may occur intermittently along with this, in the same color, are edge to edge banding and light/dark bands 20mm apart.

2. Main drive assembly was not aligned properly during reinstallation.

3. If in yellow, improper reinstallation of the cable cover on the paper feed assembly.

**Troubleshooting and Suggestions**

1. Be sure the cartridge is not “low” or running in “override” mode.

2. Verify 10.92.xx error does not appear in event log as associated with this failure. If failure is associated with a 10.92.xx error in the event log, see “10.92.00 and black color plane missing” document. This error is associated with only the black color plane.

3. Run the laser scanner motor test to make sure that the laser scanner is working correctly. If the laser scanner is not working, replace the laser scanner for the associated color.

4. If the main drive assembly has recently been removed, follow the steps in the service manual to realign the gears on the main drive assembly.

5. If in yellow and the paper feed assembly has recently been removed, check that the cable cover is installed properly.

6. See the service advisory on this issue for replacement of the OPC gears.

> **NOTE:**
>
> Do not replace the print cartridge for this issue, unless it indicates an “order” or “replace” message.

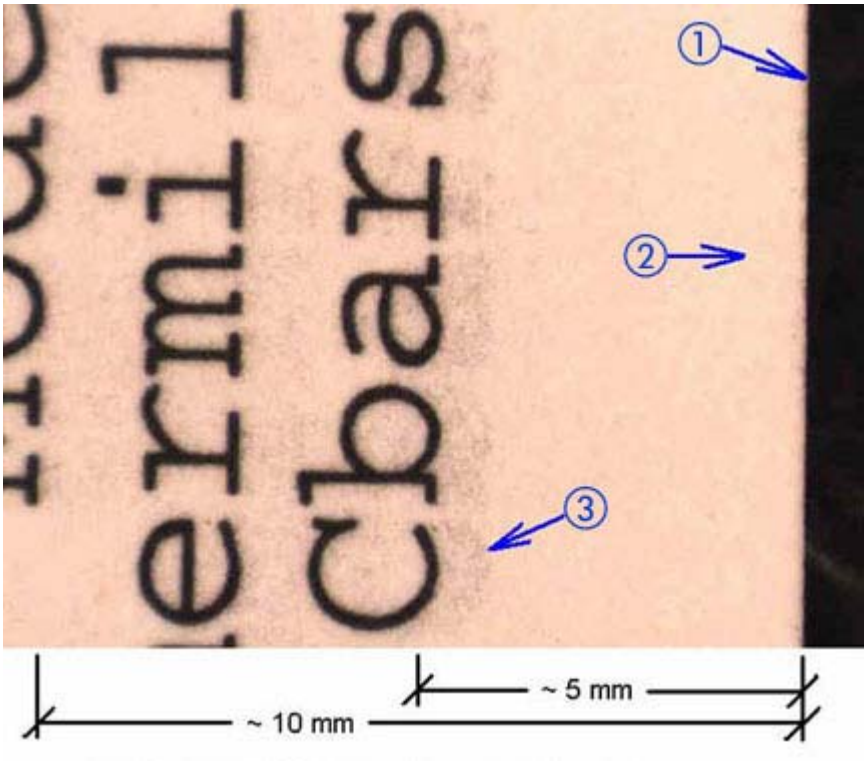
**Recommended Parts**

If all other issues have been ruled out, replace the OPC grounding springs per the service advisory.

top

## Toner scatter

**Figure 28: Typical leading edge forward scatter on heavy media in dry environment**




**1 - Leading edge**

**2 - Feed direction**

**3 - Forward scatter**

**Defect description**

Printed text appears to be fuzzy, especially black text superimposed over colored background. Most commonly seen when duplexing.

**Possible Causes**

This scatter is most common with dry paper conditions that can occur in low humidity environments or when printing on both sides. It is most common on heavy media. Above is a photo of typical performance on heavy media (65#) from a low temperature and low humidity environment. The forward scatter is most easily seen in the black toner but can also occur in the color toners.

Typically seen toward the end of print cartridge life.

**Troubleshooting and Suggestions**

In low humidity conditions, the use of freshly opened media can help reduce the tendency for forward scatter, especially for single sided printing. Media that has been allowed to dry in the paper trays for extended periods can be susceptible to forward scatter.

More flexible media will sometimes reduce the forward scatter since its path is more quickly controlled than stiff media. Thick media can be especially susceptible to leading edge forward

scatter.

Media with different surface properties will sometimes reduce the amount of scatter. The toner and the media surface can tend to hold an electrostatic charge too long on some media and are thus susceptible to discharge in the paper path.

Scatter may be reduced after printing 100 pages, due to the normal toner maintenance process within the print cartridge (every 100 pages the toner is "stirred" to retain the appropriate charge properties). Try setting the paper type to "light <75 g/m²". Replacing the toner cartridge may temporarily solve the problem, if seen later in the print cartridge life. It may reoccur for the reasons with a replacement cartridge. The only way to completely resolve the issue is to try creating a more humid operating environment.

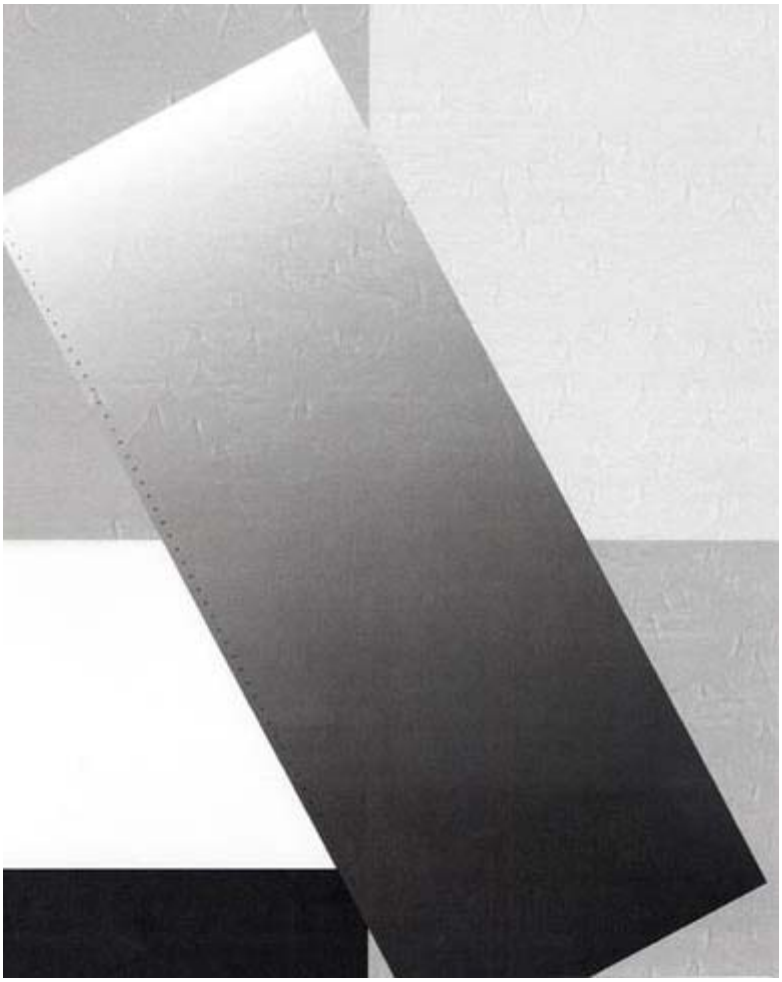
**Recommended Parts**

None.

top

## Breakdown - chicken tracks

**Figure 29: Breakdown (chicken tracks)**



### Defect description

Breakdown chicken tracks, simplex mode also called 'discharge marks' are an irregular, wave-like pattern that resembles a chicken track imprint and appear in lighter halftone image areas. Typically at the trailing edge of the page.

### Contributing Condition

Printing on thin paper or paper which has been exposed for a long time in Low Temperature / Low Humidity environment. Operating the printer in low temperature low humidity environments.

### Possible Causes

The toner on the paper scatters due to the electrostatic discharging when the trailing edge of the paper separates from the ETB.

### Troubleshooting and Suggestions

1. Use 75 g/$m^2$ - 120 g/$m^2$ media.
2. Use fresh paper.
3. Increase the ambient temperature and humidity.

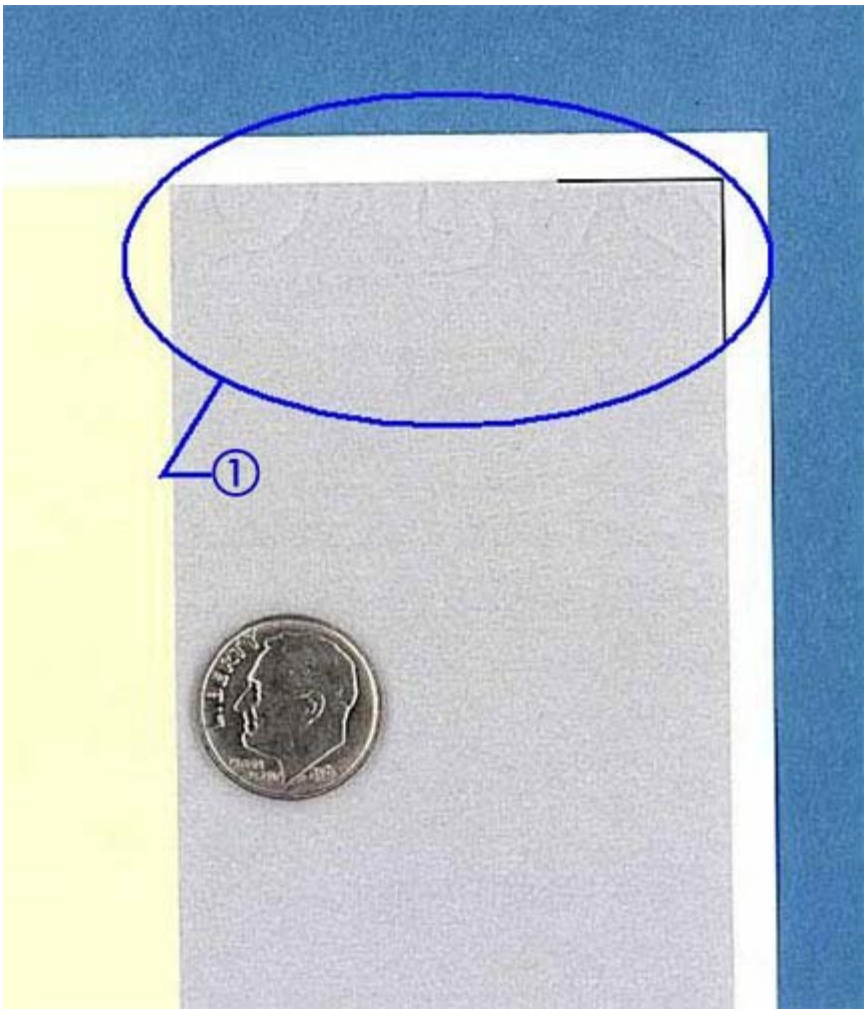
### Recommended Parts

None.

top

## Discharge marks (Similar to chicken tracks)

**Figure 30: Discharge (chicken tracks)**




**1 - Typical trailing edge discharge on dry media.**

**Defect description**

Discharge marks can appear at the leading and trailing print areas in lighter halftone image areas, which appear as an irregular, wave-like pattern that resembles a chicken track imprint. These discharge marks are most common with dry paper conditions that can occur in low humidity environments or when printing on both sides.

**Leading Edge**: The leading print area marks tend to be thin tendrils of disturbed toner and can be up to 20 mm or longer from the leading paper edge. The leading edge marks shown in the above image are most easily seen in the black toner but also occur in the color toners.

> **NOTE:**
>
> Leading print area or leading edge refers to the first edge exiting the printer and may or may not be the top of the image.

**Trailing Edge**: Trailing edge marks tend to be obvious fan marks of disturbed toner. They can be up to 10 to 15 mm from the tailing paper edge. As with the leading edge marks, trailing edge discharge marks are most easily seen in the black toner but also occur in the color toners. See the above image.

**Contributing Condition**

Operating the printer in a low temperature, low humidity environment and/or printing on thin paper or paper which has been fully acclimated to a low temperature, low humidity environment.

In dry conditions, electrostatic discharge can occur as paper touches or separates from various surfaces in the printer. Discharge can occur when paper goes between rollers, as paper separates from the transport belt, and as paper is directed with guides and ribs. This discharge can disturb the toner on the surface of the paper causing various visible patterns.

The patterns above typically occur as the paper separates from the ETB and as the paper is guided into the fuser rollers. When the paper is captured in the fuser and still electrostatically attached to the paper transport belt, the path the paper takes between the belt and the fuser can be controlled and the discharge marks minimized. However, the leading and trailing edges are difficult to control and discharge can occur as the paper exits the transport belt or touches guides.

**Troubleshooting and Suggestions**

In low humidity conditions, the use of freshly opened media can help reduce the discharge marks, especially for single sided printing. Media that has been allowed to dry in the paper trays for extended periods can be susceptible to discharge marks.

If the defect appears in normal environmental conditions (T > $19^{o}$ degrees C, % RH > 20%), then more flexible media will sometimes reduce the discharge since its path is more easily controlled than stiff media. Thick media can be especially susceptible to trailing edge discharge.

Media with different surface properties (lower surface resistivity) will sometimes reduce the amount of discharge. The toner and the media surface can tend to hold an electrostatic charge too long on some media and are thus susceptible to discharge in the paper path.

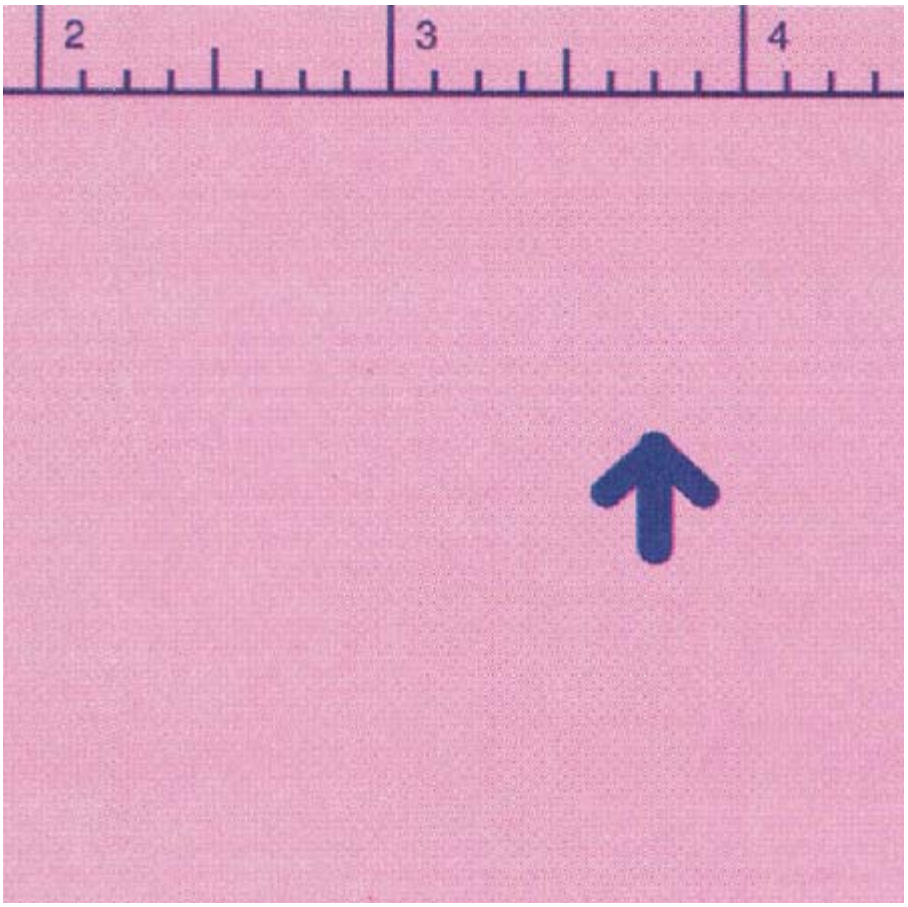
**Recommended Parts**

None.

top

## Banding, small pitch, less than 2.4 mm

**Figure 31: Less than 2.4 mm Banding, small pitch**




**Defect description**

Dark narrow horizontal bands typically visible in half tone colors that repeat at a small pitch spacing of 1.6 to 2.4 mm.

**Possible Causes**

This is caused by gear chatter between various engine and cartridge gears.

**Troubleshooting and Suggestions**

Small pitch banding is inherent to the print process due to the meshing of gears.

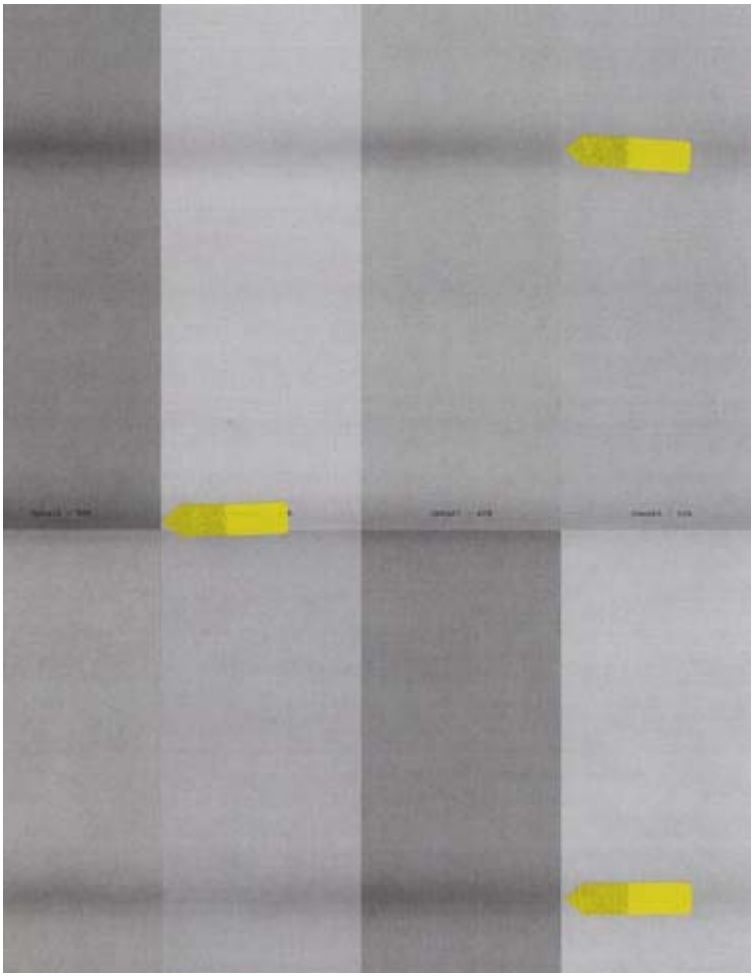
**Recommended Parts**

None. Reseating or Replacing the cartridge may improve the banding, but cannot be guaranteed.

top

## Banding OPC Light Damage, 94 mm pitch

**Figure 32: 94 mm Banding - OPC, light damage**



**Defect description**

Dark narrow horizontal bands (Approximately 10 mm wide) typically appear in halftone colors at the 94 mm OPC drum pitch interval.

**Contributing Condition**

Improper storage and light exposure of OPC drum.

**Possible Causes**

Extended light exposure of OPC drum surface changes charge properties of OPC.

**Troubleshooting and Suggestions**

Ask the customer if they are storing the cartridges outside the box and/or bag. Warn the customer that this is the cause and to avoid this in the future. The light damage does fade over time, but can take awhile. Replace the cartridge this first time.

**Recommended Parts**

Toner cartridge.

top

# Color Toner Missing from Color Documents

**Figure 33: Color missing**

### Defect description

Color toner is missing either on the full page or on a portion of the page. Color may be evident, but extremely faint. If calibration occurs while the ETB is in this state, two stripes of toner (calibration patches) may be on the backside of images, along with 54.xx errors in the event log.

### Possible Causes

The transfer rollers in the ETB are not alienating properly.

### Troubleshooting and Suggestions

1. Verify that the color cartridges are not running in Override at Out Mode. Print a Supplies Status Page and check for the message “Supply Used After Out with OVERRIDE” under the cartridge part number. When a cartridge is used in this mode, the toner may be depleted, causing that color to fade.

2. Confirm that the image is not merely printed in grayscale. If the full image is printed (i.e. if areas that should be printed in color are printed in grayscale), then the printer may be experiencing one of the following:
    - The customer may be using a black-only print driver.

- "RESTRICT COLOR USE" may be set to "COLOR IF ALLOWED" or "DISABLE COLOR" through the control panel or EWS.
- "COLOR SUPPLY OUT" may be set to "AUTOCONTINUE BLACK" through the control panel or EWS.

3. Verify that all three color planes (CMY) are missing from or appear very, very faint on the Supplies Status Page.
4. Set Color/Black Mix in the System Setup Menu to the default setting of "Auto". The "Mostly Black Pages" setting may exacerbate the issue.
5. Open and close and the ETB. This will sometimes resolve the issue temporarily, so the product will work correctly until a replacement ETB can be obtained.

**Recommended Parts**

Replace the ETB.

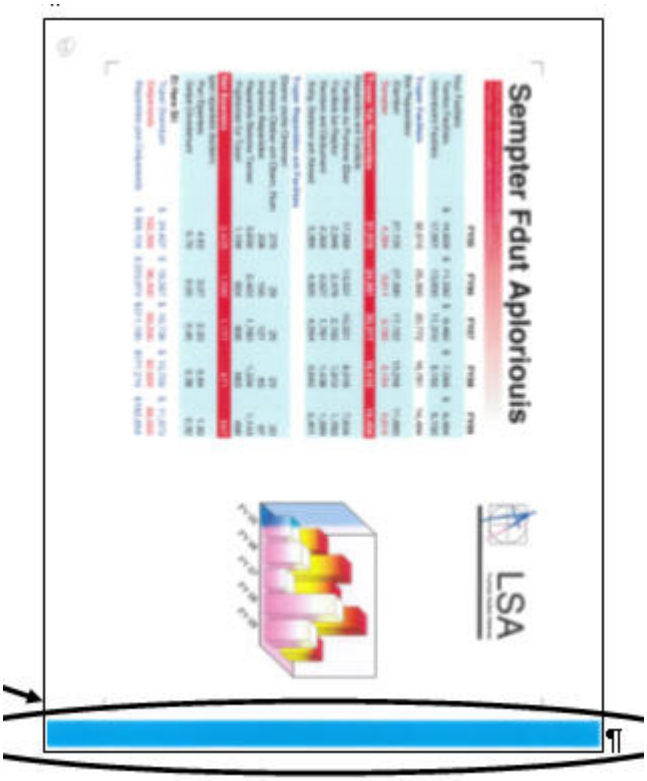
**NOTE:**

Do not replace the print cartridges for this defect.

top

## Edge to Edge Solid Bands

**Figure 34: Example of Edge to Edge Solid Bands**




**Defect description**

A band or bands of varying width appear randomly on pages, from edge to edge. Additional defects that may occur intermittently along with this, in the same color, are partial or complete missing color plane and light/dark bands 20mm apart.

**Possible Causes**

The OPC grounding spring is not making adequate contact.

**Troubleshooting and Suggestions**

See the service advisory on this issue for replacement of the OPC gears.

> **NOTE:**
>
> Do not replace the print cartridge for this issue unless it indicates an “order” or “replace” message.

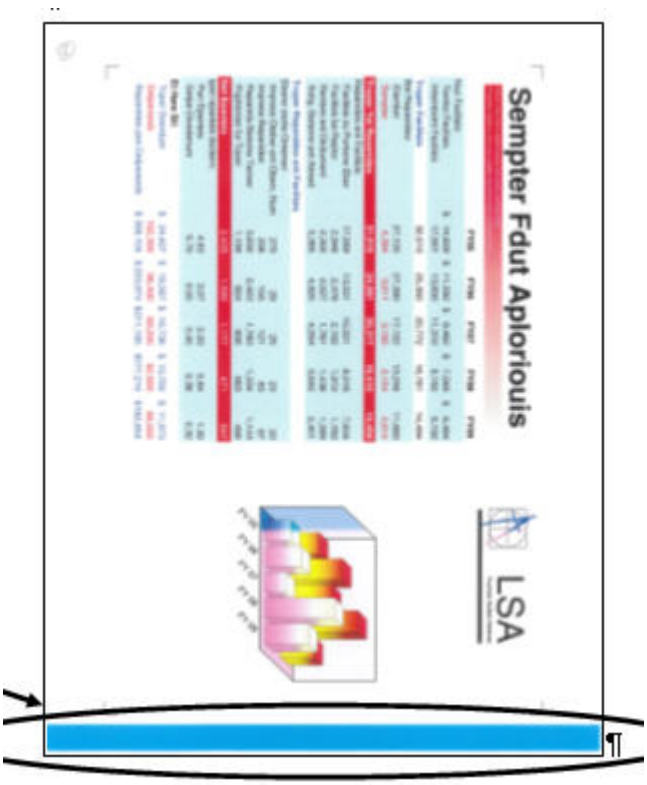
**Recommended Parts**

If all other issues have been ruled out, replace the OPC grounding springs per the service advisory.

top

## Light and dark bands on page (at 20mm offset)

**Figure 35: Example of Light and dark bands on page (at 20mm offset)**




**Defect description**

A light band (toner missing) followed 20mm's later by a dark band (extra toner). Additional defects that may occur intermittently along with this, in the same color, are partial or complete missing color plane and edge to edge banding.

**Possible Causes**

The OPC grounding spring is not making adequate contact.

**Troubleshooting and Suggestions**

See the service advisory on this issue for replacement of the OPC gears.

> **NOTE:**
>
> Do not replace the print cartridge for this issue unless it indicates an "order" or "replace" message.

**Recommended Parts**

If all other issues have been ruled out, replace the OPC grounding springs per the service advisory.

top

## Scan/Copy Image Formation Troubleshooting

**NOTE:**

Applicable to the Color LaserJet 4730mfp only.

top

## ADF Streaks

**Figure 36: Example of ADF Streaks**

### Defect description

Using the automatic document feeder (ADF), color copies and scans of dark images have blue, red and green streaks down the length of the copy or portion of the copy. The streaks may not be evident in lighter color tones or where only one color of toner is applied.

### Possible Causes

Debris has settled on the glass or in the Mylar scan window in between the page and the scanner. If the dust is large and black the streaks will be black. If the dust is white, the streak will be white. If the dust is extremely small it may block only one pixel, resulting in red, green or blue streaks.

### Troubleshooting and Suggestions

1. Wipe the glass with a lint free rag to remove any dust. Warning: facial tissue will create more dust.

2. Replace the mylar in the ADF scan window.

3. Use the flatbed scanner. When the flatbed scanner is used, the page stays stationary and the scanner moves, so even if dust is on the glass streaks will not be apparent.

4. Copy in black and white. In a black and white scan, the small red, green and blue lines are not seen and the light gray streaks are less obvious.

5. Change the standard copy options – An option that may improve the streaks includes changing the Page Content setting for the original to Photo. Also, setting the darkness to a lighter setting may help and will also save toner.

### Recommended Parts

Do not replace any parts for this issue. Use the workarounds above.

top

## Dark, Blurry Copies or Scans

**Figure 37: Printed image - correct**

**Figure 38: Copied image - dark and blurry**

### Defect description

Copies print dark, with blurry text and blotchy areas of extra toner. Printed documents print correctly and scanned images (Scan to Email or Scan to Folder) also look correct.

### Possible Causes

Calibration failure, possibly caused by the ETB transfer rollers not alienating correctly. This issue typically occurs following a “normal” calibration cycle.

### Troubleshooting and Suggestions

To isolate the issue:

1. Print an Event Log - the last calibration cycle will likely have caused 54.xx errors to be logged in the Event Log.

2. The issue does not appear when the Page Content of the original is set to Glossy Photo.

3. Make a color copy, describing the original with Page Content of Glossy Photo to ensure the issue does not appear. The original used to make the copy need not be an actual glossy photo. However, if it is not, the resulting copy may contain a moiré pattern, but the dark, blotchy areas will be gone.

4. Once the issue is verified, upgrade to at least firmware version 46.121.2, which resolves this issue.

### Recommended Parts

Do not replace any parts. Upgrade to at least firmware version 46.121.2, which resolves this issue.

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